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# MOTOR AGE

VOLUME XXI

CHICAGO, APRIL 25, 1912

NUMBER 17



## Stoddard-Dayton Saybrook

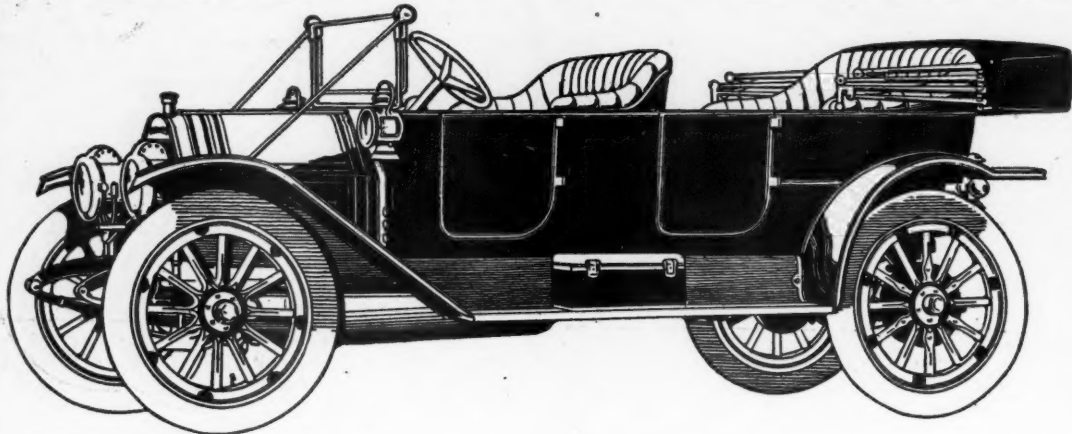
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# MOTOR AGE

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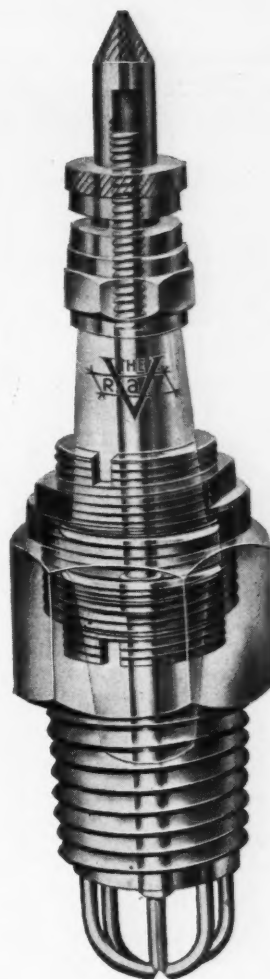
## Contents

CONVICTS AN ASSET IN ROAD BUILDING.....	5
Employment of prisoners on highways solving big problem— Working of honor system in Colorado and Oregon described	
CHAIN CASES UP IN BUFFALO.....	12
Injunction arguments heard in suits brought by Parsons	
SLOW WEEK IN CRUDE RUBBER.....	13
Prices sag—Activity in Goodrich stocks—Peerless bond issue	
EDITORIAL—THE UNNOTICED FORCES IN THE FACTORY.....	14
SEEK TO AMEND COUNTRY'S PATENT LAWS.....	15
Two bills introduced into congress designed to regulate inventions	
DOMINION CHECKS UP MOTOR BUSINESS.....	16
Review of exports and imports for 1911—American-made cars popular in Canada—Trade conditions	
REVOLUTION UPSETS CAR TRADE IN MEXICO.....	17
Disturbances in the republic scare away wealthy men inclined to become motorists—Ranchmen buying many trucks—Activity in road building	
LATE SPORTING NEWS.....	18
A. A. A. executive committee decides to start tour either from Detroit or Indianapolis—Milwaukee probably will use Green- field course for Vanderbilt and grand prix road races—Stren- uous Texas reliability—Many star drivers chosen for French grand prix	
MASSACHUSETTS' METHODS OF EXAMINING CHAUFFEURS.....	22
How Bay State handles the drivers' problem	
ACCIDENTS IN BAY STATE PROBED.....	23
System whereby investigators place the blame	
NEW YORK'S STANDING IN THE INDUSTRY.....	25
Census report tells of 3 years of manufacturing	
SWISS PUTS OUT CAR WITH NOVEL FEATURES.....	32
Fischer designs non-poppet motor differing from conventional— Unusual change-speed gear	

### DEPARTMENTS

Coming Motor Events.....	15	Motor Car Repair Shop.....	41
Routes and Touring Information		From the Four Winds.....	42
Department .....	20	Current Motor Patents.....	44
Readers' Clearing House.....	26	Among Makers and Dealers....	46
Realm of Commercial Car.....	34	Development Briefs .....	48
Mathematics of Motoring.....	40	Brief Business Announcements.	50

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First installed 1905 in Detroit, Mich.

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The first kiln we ourselves installed was that for the International Harvester Company.

We have since received five orders from this company.

The Moline Wagon Company has forty-two of these kilns installed.

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It embodies a positively new principle, a free circulation within a room, allowing the perfect regulation of temperature and humidity.

We have worked out a very simple construction to allow you to **use steam at any pressure**, hot water or electricity.

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**One horse-power of steam per day heats the room.**

It is installed at factory floor level between high or low floors.

You can easily install from our plans.

Our shop capacity is such that we can ship apparatus for a hundred rooms per day.

Shall our representative call?

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# MOTOR AGE



HOW SOUTHERN ROADS ARE BUILT—CONVICTS AT WORK NEAR BRANDY, VA.

## Convicts a Big Asset in Road Building

COLORADO'S convicts are saving the state over \$75,000 a year on its roads and at the same time are building hundreds of miles of permanent highways throughout the state. The inmates of the Oregon penitentiaries are constructing roads of the highest class at one-third of what it would cost to build them by contract. The state of Washington is employing its convicts in the same way and for 21,075 days of convict work has made an average profit of \$3.95 for each day

By Darwin S. Hatch

Prisoners Exchange Good Highways for  
Semi-Liberty and Health

\*\*\*

Honor System Revolutionizes Methods of  
Highway Improvement

\*\*\*

Work Accomplished in Colorado, Oregon,  
Washington and Other States

one convict was worked on the new Columbia river highway. The 40 miles of roads built by the convicts of Montana were made at 20 per cent of what it would cost under contract. New York and Georgia have employed convict labor on the roads for many years with success, and the states of Florida and Nevada are beginning the system. The Michigan legislature has recently passed a law providing for convict labor on the roads. Convicts form one of the chief road-making



FAMOUS SKY-LINE DRIVE NEAR CANYON CITY, COLO., A PRODUCT OF CONVICT LABOR UNDER THE HONOR SYSTEM

agencies of North Carolina, Virginia and Tennessee.

In every state where roadmaking by convicts was conducted under the direct supervision of the penal officers there has been effected an enormous saving to the taxpayers of the state. But, what is, if anything, more important to society as a whole, there has been a reclamation of the convicts themselves, directly traceable to the conditions of their open-air employment. Particularly is this true where the

so-called honor system is fully employed.

Most motorists and other good roads enthusiasts believe that the use of convicts on the public highways is the ideal method of road building and maintenance. In fact, the majority of the penal authorities agree that the outdoor work is one of the best means of keeping the convicts healthy and out of trouble. The chief objection heretofore has been the expense of guarding the prisoners when they are away from the walls of the institution. Where, as in Georgia, there is one armed guard constantly on duty for each six or eight convicts, or where, as in Washington, a heavy stockade or bull pen is erected at every camp, the expense of providing these safeguards increases the cost.

#### Colorado's Honor System

Through the work of two far-sighted men in two western states there has been developed a system of guarding the convicts which has practically eliminated this expense and made conscientious workmen of convicted criminals. The system, it is believed, can be applied equally well in any state. The men who are responsible for this method are the warden of the Colorado state penitentiary and the governor of the state of Oregon; their scheme is known as the honor system.



ESCAPE FROM THE ROAD GANG IS NOT EASY IN THE SOUTH

**EDITOR'S NOTE**—Motor Age is indebted to the office of public roads, department of agriculture, for photographs of convict road work in the southern states and to T. J. Tynan, warden of the Colorado state penitentiary, for the Colorado scenes.

Colorado has taken the lead in the application of the honor system in its penitentiary, not only in road work, but on the farms connected with the penitentiary as well. Both roads and farms have returned great profits to the state, but it is with the road work that motorists are the most interested. Thomas J. Tyman, war-

#### TRUISMS OF TYMAN

*Colorado convicts are building 5,000 miles of good roads at less than \$1,000 per mile.*

*This is the smallest saving—the saving in manhood, in character has been ten times as great, and cannot be judged by a standard of dollars and cents—for who can place a value on manhood?*

*The success of the honor system lies in the lure of added privileges.*

*There is honor among thieves.*

*Each convict placed on honor will do a good 8 and 10-hour day's work, and will do more intelligent work than the average laborer one finds in a construction camp.*

*Seventy-five per cent of the men serving sentences need not be confined behind prison walls, but can be worked profitably in the open air on the public highways.*

*Our only failures have been the hobo, jelly-back class.*



### TRUISMS OF TYNAN

*The man who commits a daring crime has courage; if we can divert this courage to the right path it assures its own success.*

*The average man sent to the average prison is a more skilled and cunning criminal on leaving the prison than when he enters it.*

*We can no more reform a man with a club than we can reform a drunkard with more whiskey. Nor can we reform a man by placing him in a prison factory and teaching him a so-called trade which is never of any use to him unless he competes with women and the helpless blind.*

*Bad men are only bad boys grown up.*

*Crimes committed by these men are the record of society's own failings.*

*Any prison that sends out unbattered, bitter and vengeful men is only a millstone around the taxpayer's neck and a menace to the society it is supposed to protect.*

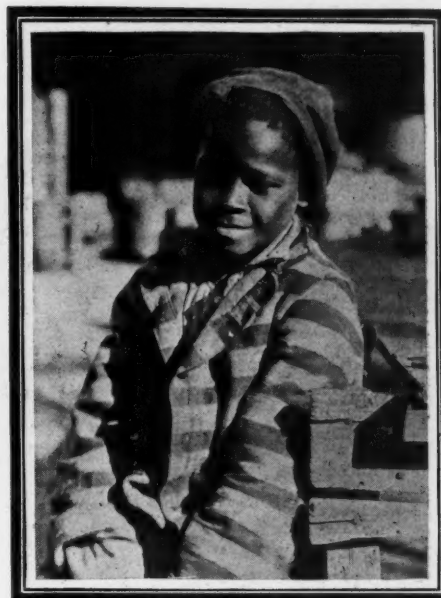
den of the state penitentiary at Canyon City, is the father of the honor system of working convicts on the state highways of Colorado. He has demonstrated that, along with the production of roads, the greater benefit in the reclamation and reformation of criminals has been accomplished. Just what is meant by the term honor system in Colorado is best shown by the way it is carried out there.

Convict labor on state highways as conducted in Colorado is not to be confounded with the road contract camps in the south where the prisoners are sold at auction to the highest bidder. The system is based on the old adage that "there is honor among thieves." This, Warden Tynan has proved to be literally true, and has induced the convicts to give him the same loyalty as they give their fellow prisoners. This is attested by the fact of the 1000 men employed on the road camps in the last 3 years with almost full liberty to escape only nine have broken their word. One of these came back a few days later and voluntarily gave himself up that his fellows might not be deprived of privileges by his dereliction.

#### Road Work an Honor

There are no armed guards to hold the convicts in check; only two guns are allowed at the camps and these are for protection against the wild animals that occasionally visit them in search of plunder. The degrading stripes of the convict uniforms are absent. The men are furnished with neat blue or khaki clothing. The men in the road camps are supplied with plenty of good food, lodged in comfortable bunk houses, work 8 hours a day, with Sundays off to play ball, fish, read, listen to the phonographs or amuse themselves as they see fit.

To be selected for road work is the highest honor the Colorado convict can attain and it carries with it a material reward in the way of shortening sentence. The men are selected solely on their records as convicts and not at all on any previous police record they may have. Of



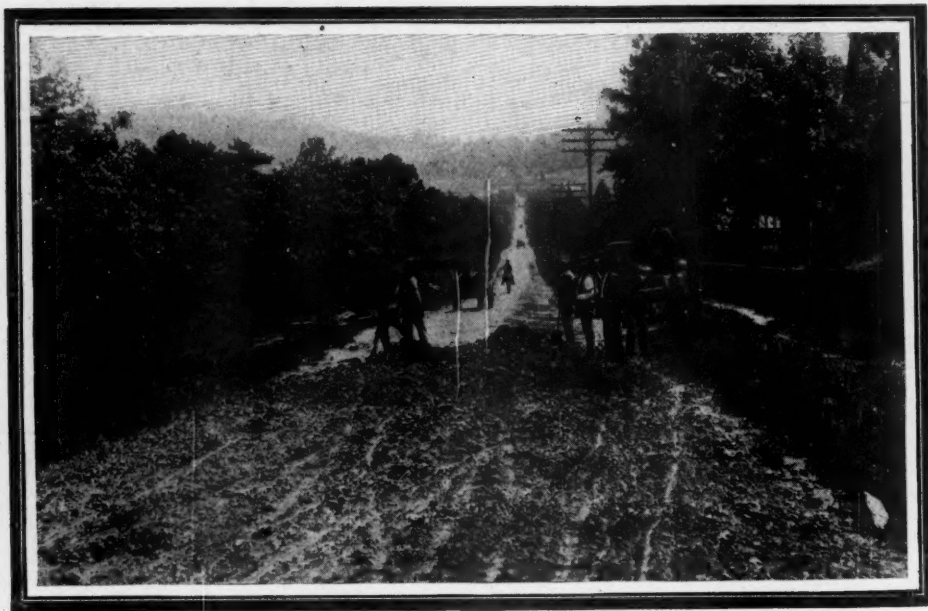
YOUTHFUL MEMBER OF TENNESSEE CONVICT ROAD GANG

the 106 life prisoners in the penitentiary at Canyon City nineteen are in the road camps. Some of these are the western bad men of murderous fame, and none ever attempted to escape. Each prisoner employed on the road is allowed 10 days on his sentence for every month passed in road work.

By a system of correspondence with relatives and friends of the convict and by securing their endorsements and guarantee the prison authorities feel safe in trusting him with this measure of liberty, and feel secure that he will think twice before he repudiates his relatives,



CONVICTS GRADING STREETS IN WINSTON-SALEM, N. C. THE STRIPES AND ARMED GUARDS UNIVERSALLY SEEN IN THE SOUTH ARE ABSENT UNDER THE HONOR SYSTEM



STATE PRISONERS REPAIRING HIGHWAY AT CHATTANOOGA, TENN.

family and friends by escape. Warden Tynan personally has many talks with each prisoner before he leaves for the road camp and in these talks Tynan believes is found the keynote to the whole situation. The prisoner feels that he is talking to one that has his interest at heart and he is placed on honor to be true to the trust reposed in him.

#### Convict Road Camps

Road camps are established wherever the road work is to be done, sometimes as far as 400 miles from the prison walls. There may be anywhere between 25 and 100 convicts in one camp managed by two paid guards and under the supervision of an experienced road building expert. All of the equipment for camp and road work such as the implements, horses and mules is owned by the state and is moved with the camp from one point to the other as the sections of road work are completed. Usually about 6 or 8 miles of road is completed before the camp is moved. Not only is the actual construction of the roads themselves carried on by the convicts but a part of the surveying required is done by the prisoners and all bridges are constructed by them, as the camps are supplied by a force of convicts experienced in concrete and masonry construction. In some of the more remote camps the convicts do not see the prison walls from one year's end to another. One of the life prisoners has been away from the penitentiary for over 3 years. The roads to be worked upon are determined by the state engineer and the state highway commissioner.

During the first 2 years of the honor system in Colorado roads were constructed for \$56,700 which under the usual method of contract work would have cost \$212,000. In 1 year over 100 miles of good roads have been built at a cost to the tax payers of less than 36 cents per day per man, and has proven equal to a \$2 and \$3 day's work. To illustrate the

economy of this method of road-building, figures on a representative stretch of road may prove interesting. From May to October, 1911, there was a camp of fifty-five convicts working on the road from Colorado Springs to Canon City. In this 5 months 11 miles of road was built, half of which was through rocky foothills. The total cost to the state was considerably less than \$1000 per mile, and this included the entire maintenance of the camp, feeding the men, salaries of overseers, grain for the teams, new equipment, dynamite and so on. A total of 208 working days was required.

If these fifty-five men had been paid \$2 a day, the least that the skilled laborer will work for, the wage item alone would

have amounted to \$22,880, not to mention the other expenses connected with the work. Another stretch of 5 miles of road which required a rock wall of 1114 feet, of which over 400 feet was re-enforced concrete, and the removal of 43,000 cubic yards of dirt was accomplished at a total cost of less than \$4000. The rock wall and the dirt removal alone would have cost over \$9000 if done by free labor, as based upon figures received from contractors. This work was done in 142 working days and at an average cost of 27.7 cents per day per man.

#### Sky-Line Drive Convict Work

For 2 years the convicts of Colorado have been working on the historic Santa Fe trail, converting it into a boulevard that is the pride of the state. The famous Skyline Drive is solely the work of convicts operating under the honor system. When a system of road-building produces as this has done the best of roads at from one-fourth to one-third of their normal cost and at the same time removes from the tax payers the burden of maintaining prisons and makes them self supporting, turns the convicts back to society as reclaimed citizens, each with a good trade and a sound body it can certainly be called a success. Its success lies chiefly in the lure of added privileges such as sunshine, outdoor work, additional time off and self-respecting conditions, all of which is had as a result of the prisoner's own conduct and deportment.

Oregon is another state in which the far-sighted authorities are employing the convicts to the betterment of the roads, the convicts themselves, and society as a whole, and doing it all at much less cost than is possible in any other way. The



TUNNEL DRIVEWAY INTO ROYAL GORGE. MOTOR CARS CAN PASS ANYWHERE ON IT. CONSTRUCTED BY COLORADO CONVICTS





LOOKING UP PRIEST CANYON ROAD TO TOP OF ROYAL GORGE—CONVICT ROAD

honor system is in vogue there but in a slightly different way than as practiced in Colorado. The prison reform methods of Governor West of Oregon have attracted attention throughout the country. Like Warden Tynan, he takes the view that there is a spark of good in the heart of every man, no matter how depraved.

There is no law authorizing the use of the state prisoners on the highways of Oregon but the governor of this state like the governors of most of the others has authority over the men confined in the state penitentiary. Upon his personal authority Governor West has arranged that the various counties of the state and the different organizations in the cities can draw upon the penitentiary for road gangs. The county commission, or motor club, applying for convicts establishes a camp near the section of road to be improved or constructed. The camp must consist of tents with board floor for sleeping quarters, a dining or mess tent, kitchen and blacksmith tents with an office for the supervising engineer of the road under construction.

#### Oregon's Honor Men

The association promoting the road receives the men from the penitentiary, pays their cost of transportation to the camp where the men are assigned to quarters. A wage of 25 cents per day is allowed to give them spending money for tobacco, etc., liquor is not allowed, the

supposition being that as honor men they have no desire for it. Talking machines and other musical instruments as well as newspapers and magazines are supplied in the reading, or club tent. The trip to the camp is made without guards, without shackles and without stripes. They are no longer known as convicts, or prisoners, they are known as honor men. Arrived at the camp they find that there is no wall built around them, not even a barbed-wire fence. There is no high lookout for the guard, because there are no guards, there

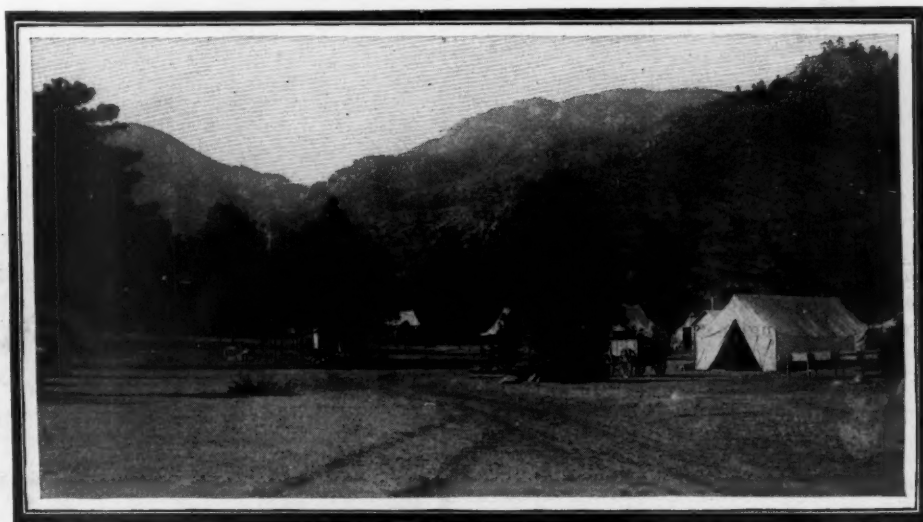
are no rifles or weapons of any sort in the camp. Before leaving the prison the convicts give their word that they will not attempt to escape from the camp and that they will not allow any of their number to escape. They are informed that an attempt to escape will result in all of the crew being returned to the penitentiary, which has proved a very efficient check upon any malcontents there might be.

The convicts work 8 hours a day for 6 days in the week and have Sunday off. They are supplied with an abundance of good food, prepared and cooked by one of their own crew and are furnished with necessary clothing and bedding. The association or county applying for a convict road gang employs a road expert who remains in the camp and directs the operation. The county engineer is usually the man selected to take charge of the honor camp. The general conduct of the camp is in the hands of a local superintendent who merely visits the camp occasionally to make a general inspection and receive his reports. Any complaints are transmitted by him to the governor.

#### Convicts Their Own Guards

Usually the camps are far removed from the main settlement which would permit the entire crew to escape into the mountains before a sheriff's posse could be notified and put on its trail, but so far they have exhibited no such desire. It is told of the only time when an attempted escape was made by the honor men of Oregon that three men attempted to run away shortly after the camp was established. The rest of the camp telephoned to the sheriff and then set out after the fugitives and captured them before they reached the railroad. It is said that the trio was in danger of rough handling from the honor men who were much incensed because three of their number had violated the rule and endangered the liberty of the camp as a whole.

Oregon has at present at work on its roads 100 honor men, which is about 25



CONVICT ROAD CAMP IN COLORADO. PRISONERS ARE BOUND BY WORD OF HONOR, WHICH TAKES THE PLACE OF A STOCKADE AND ARMED GUARDS



AT LEFT—DEAD MAN'S CANON, ON THE NEW STATE HIGHWAY BETWEEN COLORADO SPRINGS AND CANYON CITY. AT RIGHT IS TOP OF A MOUNTAIN ON RAINBOW ROUTE OF SANTA FE TRAIL

per cent of the men in the state institution. Records of road construction by the honor men show that at an average cost of less than \$1 per day per man work is done upon the highways equal to that accomplished by any selected road crew of free men who must be paid \$2.50 wage. Everything needed to establish a road camp for a year's occupancy is included in this cost of \$1 per day for each man.

#### Washington's Convicts Profitable

In the state of Washington there is no attempt to employ the honor system, but for the past 5 years convicts have been successfully worked on the construction and maintenance of roads throughout the state. In conjunction with the road work convicts are employed also in the stone quarries from which the road-surfacing material is obtained; so there is but little expense connected with the construction

of macadam roads. From fifty to 200 convicts are employed on the road and the same number in the quarries. This includes from 8 to 30 per cent of the inmates of the penitentiary.

The road camp consists of heavily constructed wooden bunk houses enclosed in a stockade or bull pen. A superintendent and from three to five guards are allotted to each camp. All equipment—tools, powder, etc.—is furnished by the state. Most of the work so far has been heavy rock construction so that the total mileage has not been great. When a convict is selected for road work he is given a year's assignment on parole at the quarry or at the road camp from which 3 months' time is deducted for satisfactory service and good behavior, provided the minimum term of sentence is completed. This puts the convict in line for parole

or pardon. The road work in the state of Washington has been confined to short stretches of heavy rock work and has resulted in a saving of from 25 to 40 per cent of what it would cost under the contract system, according to the state highway commissioner.

The first attempt at convict road work in the state of Washington was made in 1907 and the report of the state highway commissioner to the governor gives some interesting data as to how it was carried out. The camp established for the care of the prisoners consists of a stockade 80 by 125 feet inside of which is erected a barracks 18 by 48 feet in size, together with two large tents for kitchen and dining-room. On the outside of the stockade and adjoining it was built the guard house, a one and one-half story building 60 by 80 feet.

The work selected was the building of a wagon road along the face of a nearly perpendicular rock bluff along the bank of the Methow river, this class of work involving the handling by the convicts of a large quantity of dynamite.

#### Highway Commissioner Reports

The average daily work accomplished by each man amounted to 2.42 cubic yards of solid rock moved and 1 cubic yard of earth and loose rock. As the best bid obtained for moving this rock was \$1.50 per cubic yard and for loose earth and rock combined was 40 cents, it will be seen that the average value of the daily work of a convict was \$4.03. The itemized statement of the commissioner showed that the profit to the state over the contract price was 57.86 per cent. As the point selected for making the test was one of the most remote in the state from the penitentiary, the cost of transportation of convicts, supplies and tools, was maximum, the idea being to give the new system the most severe test possible, and as the prisoners were not landed on the work until the middle of August, when one-half the



CONVICTS RETURNING TO CAMP AFTER DAY'S WORK ON TENNESSEE HIGHWAYS



available working season had passed, the cost of transportation and building was relatively greater than had the prisoners been worked during the whole season.

Men who are furnished for this work are not those noted at the penitentiary for a desire to work, but under the careful management of the superintendent of construction they developed into a first-class crew of workmen. They were trusted to such an extent that no stripes were worn and no arms of any description were used; in fact, one passing over the work and not knowing the character of the employes would never have known it was a convict crew or the men were not free.

#### Profit to State

One of the most successful of the convict road-making camps of Washington was the camp at Lyle in the early part of 1911. This was in the construction of a part of the state road along the Columbia river. Practically all of this was of the heaviest character of rock work and extremely difficult to handle. The construction of the road, however, meant that an almost impassable road projected over a series of hills on the upper Columbia was converted into a highway with a maximum grade of 5 per cent. The average expense to the state incident to working one convict 1 day was \$1.75. The daily value of each convict's work was \$5.70 giving a profit of \$3.95 to the state for each day one convict was employed, or a total profit for 3 months of \$82,300.

During 1911 convict labor was tried out on the highways of the state of New York in Onondaga county. While the result was not entirely satisfactory on account of excessive expense in guarding the prisoners and handling them and lack of perfect organization, it shows beyond a question the practicability of using convict labor in the construction of highways in sparsely settled communities and particularly in preparing material for highway construction. In a report to the board of supervisors of Onondaga county by its



LOUISIANA CONVICTS PREPARING GRADE FOR MACADAM NEAR CHARLOTTE

committee on prison employment the committee stated that it believes that road building by convicts, if it receives co-operation of the officials and men employed, can be made profitable to the county and town and at the same time show earnings for the penitentiary greater than heretofore shown.

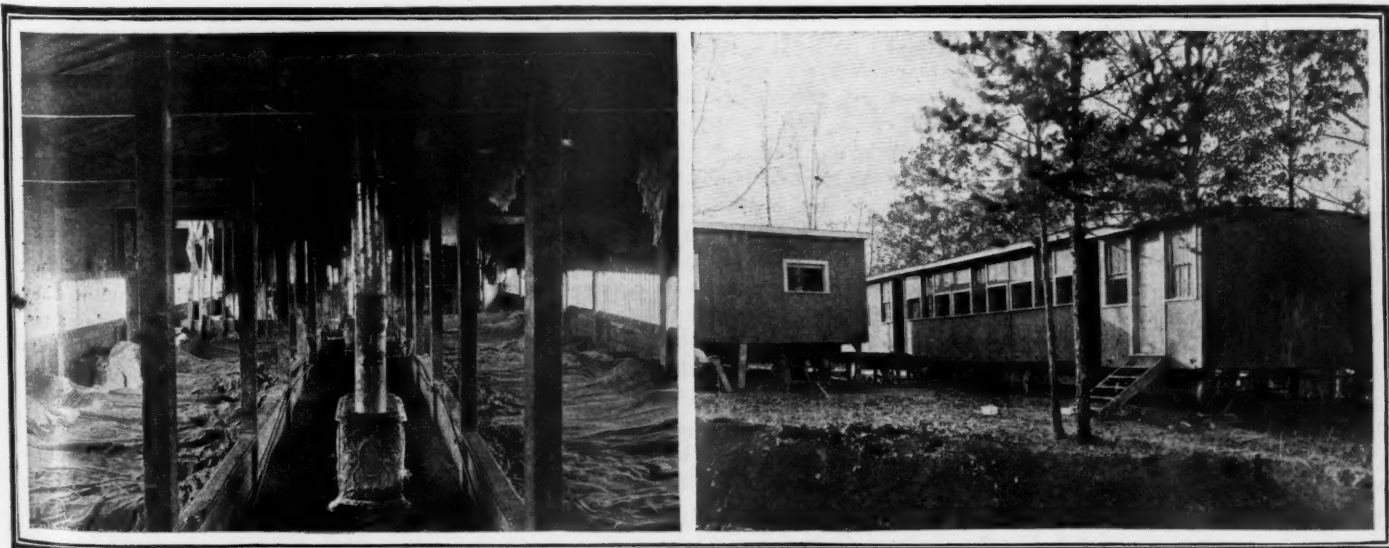
The committee was very much pleased with the experiment from the standpoint of the prisoners themselves, for in the course of the work it is safe to say that there were at least 100 different men at work on the job and not one escaped, or attempted to escape, and no difficulty of any importance was experienced.

The prisoners themselves enjoyed the work and much preferred it to confinement at the penitentiary, many of them expressing the wish that the work might continue all winter. And while this phase

of the question may not appeal to all, yet the committee is much pleased with the showing and is satisfied that much good has been done the men themselves; that their health has been benefited to a great extent and that when they are discharged they have been in condition to and have found employment and are in better condition to hold such employment regularly. The committee is also strongly of the opinion, from the experiment, that in working fifty men on the road that but five guards or keepers are needed instead of seven, as was used in this case.

#### Saving in Montana

Convicts from the state penitentiary at Deer Lodge, Montana, have been employed on the roads of that state for about 2 years. Forty miles of roads have been constructed at a cost estimated by the warden at about 20 per cent of con-



INTERIOR AND EXTERIOR OF BUNK HOUSE OF NORTH CAROLINA CONVICT ROAD CAMP

tract cost. In this state the roads are built in county units, the tools, horses and equipment being supplied by the county and a squad of convicts from the state penitentiary. The time of imprisonment is shortened 10 days for each month given to road work, so that a year man can work himself out in this way in 8 months.

The state of Georgia 8 years ago instituted a method for the employment of convict labor on the roads but the convicts are under much more stringent surveillance than in most of the other states where this method of highway construction is employed. The prisoners sleep in portable jails on wheels but during the day time they are usually unfettered although constantly under the eyes of the guards. Two guards armed with rifles are allotted to each gang of twelve or sixteen convicts. No desperate criminals are used, and escapes, or attempts at escape are infrequent.

#### Outdoor Work Preferred

As a rule the men much prefer the outdoor life with its work and limited freedom to the monotonous confinement of prison walls. The counties may secure from the state penitentiary a certain number of convicts for a definite term. These men are put at work building roads, the county paying the cost of their food. In this way excellent roads are being constructed at trifling expense. There is a demand for all of the available convict labor to be hand. In addition to the securing of good roads at a minimum cost the psychological effect upon the convicts has been very noticeable. The application begets a certain self respect that makes the ex-convict a producing member of society instead of the parasite he would otherwise become.

The state of Florida is adopting the Georgia plan with results that are very encouraging. The working of convicts on the roads of Nevada was begun in June of last year and so far has been very successful in the opinion of the warden. The state of Michigan has recently come into line, when a law was passed by the legislature in 1911 providing for the employment of convicts on public road building but as yet nothing has been done to make use of convict labor in that way under its provisions.

#### Labor Unions Not Antagonistic

Many people anticipate antagonism from the labor unions if convicts are to be worked on the roads, but in the states where convict road work has been tried the unions have proved passive in this regard. What the unions are against is the employment of the convicts in the penitentiaries in factory work, where the products of cheap convict labor compete with the products of and cuts down the wages of labor in outside factories. Convict road work accomplishes the result that the unions want. The men at work on the roads are not turning out prison-made shoes and cheap brooms to cut down the wages of union men and their families.

# Chain Cases Up in Buffalo

Arguments in Injunction Suits by Parsons Against Bison City  
Concerns Heard—Williams vs. Lozier Progress—German Krupps Score in Delaware—Motor Litigation

**B**UFFALO, N. Y., April 24—During the past week two motions for preliminary injunctions, one against the McKinnon Chain Co. of Buffalo and the other against the International Automobile League, also of this city, were argued before Judge Hazel in United States district court. The injunctions were sought by the Parsons company, an English corporation, the American representative of which is the Weed Chain Tire Grip Co. The Parsons company alleges an infringement by the McKinnon Chain Co. in the manufacture of a non-skid chain for motor cars, which is used in wet and slippery weather. The Parsons company, through its attorney, claims that it is fully protected by its patent and that under its patent it has the sole right to manufacture non-skid chains. It is contended by the plaintiff in this action that all other non-skid chains are infringements on the original, or Parsons chain. In America the Parsons chain is known as the Weed chain.

In the action against the International Automobile League of Buffalo, the Parsons company seeks to restrain it from selling all chains that are not manufactured by the Weed company. The International Automobile League, through its attorney, George C. Riley, fought the asked-for injunction on the ground that the application is too general, and that the court cannot issue a blanket injunction covering all chains but the Weed chain.

Lengthy arguments were submitted by all parties interested, and, at the conclusion of them, Judge Hazel reserved decision. The Parsons company claims that it has the sole right to manufacture these chains in that it is the first concern to manufacture a non-skidding device which does not remain stationary on the tire, but creeps as the machine goes along. The plaintiff's attorneys explained in court that the most insidious forms of infringement are the operations of small dealers and garage owners who buy the parts of chains from chain manufacturers and put them together themselves, or resell them to owners with directions as to how to put them together. Even this, it was stated, is an infringement on the original patent.

#### IN EASTERN COURTS

New York, April 23—Suit for infringement, accounting and an injunction has been filed in the United States district court by the Hartford Suspension Co. against Hoyt & De Mallie, Inc., a garage and supply house in New York, for alleged infringement of Truffault reissue patent

12,437. This is one of the patents that was involved in the recent suit of the Hartford company against the Western Mfg. Co., in which a permanent injunction was issued against the infringers.

The particular device mentioned in the complaint is not made by the defendant company, it being the Foster shock absorber. The defense has until the June rule day to file its appearance and the answer will probably be due just before vacation of the court.

Things are beginning to move in the series of suits brought within the past year on behalf of the Rose Mfg. Co. against several alleged infringers of its patents. The suits have been dragging in the United States district court and this week an order was entered by Judge Mayer, paving the way to take up a demurrer filed on behalf of Emil Grossman, who figures as technical defendant in one of the suits involving a license bracket patent.

C. C. Gill, attorney for the defense, states that there is a strong probability of action in this suit after the motion on the demurrer is disposed of. If the demurrer is overthrown and answer filed, the ordinary course of the case would bring it to a hearing by mid-fall.

#### SLOW PROGRESS IN LOZIER CASE

New York, April 20—After numerous delays, which have carried the case along in the New York supreme court for months, an order has been issued by Justice Hendrick requiring an amended bill of particulars to be filed in the suit of Fletcher R. Williams against Harry A. Lozier and the Lozier Motor Co. The suit is for \$500,000 damages based upon an alleged contract of financing of the Lozier company's plant by Williams and several Cincinnati capitalists prior to the removal of the factory from Plattsburg, N. Y., to Detroit. The claim is made that after the deal had been completed with Williams and his party, through the instrumentality of Joseph L. Rhinock, a former Kentucky congressman, Lozier rejected the proposal and moved to Detroit. The suit was entered on behalf of Rhinock and Williams to recover the amount they charge was the measure of their damages.

The defense moved for more particulars to define the limits of the complaint and the plaintiff filed such a bill in both cases. The attorney for the defense then asked for more and more definite particulars and the court has ordered such action to be taken. The court itself took a hand in defining what the new bill of particulars should contain and specifies that the particulars of the visit to the Plattsburg



# Slow Week in Crude Rubber

Prices Sag and Imports Are in Fair Volume—Activity in Goodrich Stocks—Profit-Sharing Scheme Announced by United States Tire Co.—Peerless Has Bond Issue

plant by the plaintiff shall be set out. Also, whether the tender of the amount of additional capital to be furnished by the plaintiff was in the form of a check or cash and likewise what other officers beside Mr. Lozier refused to accept the tender.

Attorneys for both sides state that several months will probably elapse before the case comes up for trial.

## TRADESMAN STARTS LIBEL SUIT

Bridgeport, Conn., April 20—Harry D. Miller, of this city, formerly president of the Bridgeport Vehicle Co., which passed through bankruptcy and is now known as the Bellamore Armored Car and Equipment Co., has brought suit for \$50,000 damages against the Bellamore company. He alleges that in a civil suit now pending before the superior court the defendant company has libeled the plaintiff. The document in question is the defendant's reply to a suit brought by Mrs. Ida E. Miller against the company to recover a certain car alleged to be owned by her. The answer sets forth the allegations that Miller and his son, George C., conspired together, manipulated the books, misappropriated funds and concealed said misappropriations, all of which forced the firm into bankruptcy.

## KRUPPS GIVEN INJUNCTION

Wilmington, Del., April 20—Judge Bradford of the United States court on Wednesday granted a preliminary injunction against the Krupp Motors Co., a Delaware corporation doing business in Pittsburgh, restraining the concern from using the name Krupp. The complainant is the Frieda Krupp Aktiengesellschaft of Essen, Germany. The Pittsburgh company did not make an appearance and the case will proceed to the issue of a final decree.

## CANADIAN VICTORY FOR WILLYS

Toledo, O., April 20—President John N. Willys of the Willys-Overland Co., of Toledo, Ohio, has won a verdict in the Canadian courts against George R. Rastall, who tried to use the Overland trade mark in Canada as the Overland Automobile Co. of Canada, Ltd. Mr. Willys has recovered the right to use his trade mark in the dominion and it is said that Rastall has left the country.

## NEW MEMBERS OF M. AND A. M.

New York, April 23—The following new members have been elected to the Motor and Accessory Manufacturers: Meteor Auto Tank Co., Sheldon Axle Co., Fafnir Bearing Co., Findeisen & Kopf Mfg. Co.

NEW YORK, April 23—Crude rubber experienced another dragging week in the markets of the world. Both buyers and sellers appeared to be waiting and as is usual in such cases prices sagged off slightly in an irregular way. Plantations were heavier than Para and the level at the opening of this week was about \$1.14½ a pound, based upon up-river fine.

Imports at New York were in fair volume, Liverpool contributing materially more than it did last week. The bulk of importations came from Tampico.

Great strength was developed Monday in the common shares of the B. F. Goodrich Co. when the stock rose on heavy buying from 79½ to 90. At this time the books of the company are closed pending the issuance of the stock and cash dividends to stockholders of record and the issues in which trades are being made are stocks to be paid over to present stockholders. All the trades are made with the proviso, when issued.

A powerful pool is credited with the buying and the rumored intention of the leaders is to put the stock on a higher level. The price of old Goodrich stock was around 250.

Announcement of the profit-sharing plan of the United States Rubber Co. has been made. Under its terms, employees of the company drawing salaries of \$1,200 a year or over may purchase common stock at 45 by paying at least \$4 per share per month. The stock averaged around 56 during March and at present is only fractionally below that figure.

## RUBBER STOCK ACTIVE

Chicago, April 23—On the curb today Goodrich stock sold at 87 for common and 108 for the preferred, following the announcement of shares subscribed. Diamond also showed remarkable activity, selling at 336, an appreciation of 16 points in half a week. This is caused, it is said, by the showing of the company, whose last dividend was 14 per cent, while its surplus is reported to be more than \$4,000,000.

## PEERLESS HAS BOND ISSUE

Cleveland, O., April 20—Announcement has just been made here confirming the rumors that have been current of a Peerless bond issue. Arrangements have been made by the Peerless Motor Car Co. to sell \$1,100,000 of 6 per cent bonds and Cleveland banks have underwritten the issue. The company also has issued additional stock to the amount of \$300,000. It is stated that \$400,000 of the bonds already have been sold. The proceeds of the bonds and stock will provide a fund to take care of the floating indebtedness

of the company and will enable it further to develop its commercial vehicle department. The Superior Savings and Trust Co. is trustee for the bonds and the Tillotson & Wolcott Co. is sales agent for the issue. The Peerless company's real estate, buildings and machinery, after depreciation charges, are appraised at \$2,320,000. This issue of bonds is a first and closed mortgage and there are no other bonds. They mature serially in from 1 to 12 years.

## NO BIDDERS FOR JONZ PLANT

Louisville, Ky., April 20—This was the day fixed by the Floyd circuit court in New Albany for the sale of the plant of the American Automobile Mfg. Co. in Vincennes street in that city, but the New Albany Trust Co., the receiver for the company, reported to the court that no bids had been received. H. E. Jewett, of the New Albany Trust Co., stated, however, that the newly organized company, known as the American Automobile Corporation, which includes a number of the members of the old company, and was organized to take over the plant of the old concern, was arranging for a settlement with the creditors of the old company with a view of taking over the plant. Mr. Jewett stated that the indebtedness of the company is about \$28,000.

## MOLDERS' STRIKE IN BUFFALO

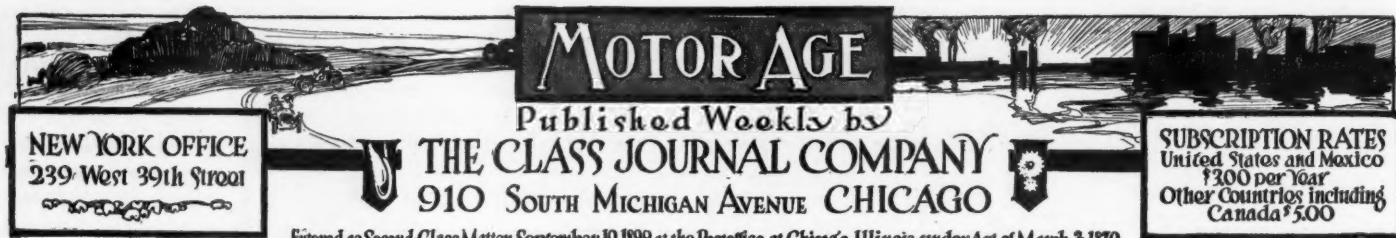
Buffalo, N. Y., April 24—Special telegram—A strike here of the molders and core-makers in the two plants of the Aluminum Castings Co., threatens to interfere with the local motor industry unless the strikers are quickly replaced or their alleged grievances adjusted, because many of the parts that make up a motor car are aluminum castings. The strike of the Aluminum Castings Co. is not confined to the two plants in Buffalo, but embraces the twelve branches of this concern throughout the country.

The local strike was caused 2 weeks ago when many laborers walked out in sympathy with the molders and core-makers. To fill these places the concerns had to get strike-breakers from other cities.

It is reported that several motor car factories have had to lay off men because of the strike, but local managers claim the temporary suspension will not in any way interfere with the filling of orders.

## ALL MUST BE LICENSED

Harrisburg, Pa., April 20—Here is a decision from the state highway department that is of interest to car owners and drivers. Heretofore if a man owned a car it was customary for him to allow the members of his family to operate it. Many men have from two or more sons who can run their father's car without taking out a license. In the future the highway commission will compel every man operating a car to take out a license. It matters not how many are in the family, if they all want to run father's car each must procure a license, which costs \$2.



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THE boy with the new suit of clothes and clean shoes goes at his work with a better spirit than when he has mussed up clothes and is dirty from collar to shoe lace. His environments become a part of himself.

According to Thomas A. Edison, accomplishments are generally one part inspiration and nine parts perspiration. The one part of inspiration precedes the nine parts of perspiration. The inspiration is the essential, without it the perspiration is impossible.

The workman in the factory is a human being, subject to the same physical laws as the cashier in the metal cage in the bank. He is affected by the same influences that affect the chemist in the laboratory. They may differ, but it is only in degree.

The conditions surrounding a man at labor, whether at the lathe in the factory, at the accountant's desk in the auditing department, on the floor of the salesroom, or at the table in the draughting department, have an influence tending to help in the accomplishment of more or holding back and making the accomplishment less.

The conditions surrounding a workman aid in creating or dwarfing inspiration. Every workman has a spark of inspiration within him. That spark is either fanned into a flame or it is left to smoulder and die in ashes. The factory conditions under which the man works may either be the fruitful oxygen to feed the flame or the ashes to blot it out.

The manufacturer who aims to build without reckoning with the factory environments of the workman is erring. He who would build without counting on the unnoticed forces builds with dollars instead of inspiration. His loss will appear at the end of the year—his balance sheet will show it. Inspection discards will be heavy, time will be lost in the assembly due to poor fittings, and the final product will be lacking.

## The Unnoticed Forces in the Factory

MOTOR car factories may be disorganized, poorly-lighted, dirty places, or they may be well-organized, well-lighted, clean and orderly places. There are both kinds. The best products generally come from the well-organized, well-lighted, well-ventilated and well-kept factory. There are good cars that come out of dirty factories, out of mussed-up factories, out of ill-lighted factories, but they are in the minority. The brighter, the well-ventilated, the orderly and the clean factory sends out the best in the artisan's art.

FACTORS in production, is a phrase that is foreign to many car factories, but has permeated every department of other factories. One big production factor is cleanliness. In a leading French car factory the workmen in the engine department dress with long white aprons, getting a clean one every morning. This factory has the reputation of building the best engine for car use in Europe. It is a common saying in the trade that any other company can buy such an engine, can take it all apart and try to build an engine equally good, but they never yet have succeeded. There seems to enter into the motor some unrecognizable merit that investigating engineers have not been able to discover. The metals used may be as good as in the original factory; the lathes, drills and milling machines may be equally accurate; the heat-treating ovens may be as well built; the pyrometers may be of the same make, but after all there is something lacking. There is an inexpressible something that gives more power, gives greater ease in running and gives longer life. Students attribute the super-merit, if the term may be used, to the workman.

PERHAPS it is that the workman has put inspiration into his work; at least, the factory superintendent hopes that he has. The factory head has aimed at such, and it is more than possible that he has succeeded. What these different forces are that breed inspiration and better effort, vary according to the factory. One leading car factory furnishes a medium-priced lunch for its workmen, preferring to have them eat good wholesome food at a table with a white cotton cover to eating a cold lunch over a beer pail in a dirty side alley. This company is willing to lose money every working day of the year on such lunch arrangement, because it reckons that better workmanship is obtained from the workman during the hours of labor. The thoughts of the workman are on a higher plane after such a luncheon as compared with the alley type. The mind of the workman has been arrested; it may be directed to thoughts on the field of service that the car has to fill, thoughts which create impressions of careful labor, accurate labor and labor that can be depended upon.

A LEADING accessory manufacturer, when he began to manufacture in the old plant, did not have the wood-box-with-sawdust cuspidor. When the new plant was built it was used, but soon an improvement in the shape of a removable sheet metal apron was placed between it and the wall. The apron could be washed each night; it was a difficult task to recalcimine the wall or repaint it. The innovation worked; the workmen grasped the meaning; there was a general improvement. That maker was engaged in the production of an article that required special accuracy. The parts were small and delicate; a little error meant discarding the whole piece; and the factory superintendent reported that with every improvement in the factory by way of greater cleanliness, better light, better ventilation and more sanitary conditions there was a reduction in the number of discarded parts.

THE suitability of the man to the machine is a factory feature that is often overlooked. Take the man at the drill press: The chair he sits on is an old box. Every time he changes position it falls over and he loses time replacing it. When he sits on it it is either too high or too low. If too high he has to lean over to his work; this puts part of the body weight on his hands. This strain is transmitted to the piece of metal under manufacture, which may be misformed or misshaped, due to this weight. This is particularly so where delicate parts are being handled. But this is only one of the evils of the high seat. The workman's back soon tires, his efficiency drops, inaccurate workmanship results, and there is a drop in efficiency all along the line.



# Seek to Amend Country's Patent Law

WASHINGTON, D. C., April 22—Two bills, designated respectively H. R. 29,193 and S. 6273, are now before congress, the former introduced by Representative Oldfield, chairman of the committee on patents, and the latter by Senator Brown, which apparently cover the patent situation. The Brown bill has an amendment tacked on, otherwise it is identical with the Oldfield measure. The senate bill has reached its third reading.

The bills provide for the separate installation of the patent office, which heretofore has been a bureau of the department of the interior. They designate the make-up of the office as a commissioner of patents, first assistant commissioner and assistant commissioner and 1,029 other officers and clerks, including forty-three principal examiners. They define the duties of all in a general way and provide that no member of the office shall be interested in any patent issued except by way of inheritance or bequest. The commissioner and his assistants with the examiners in chief shall constitute a board of appeals to review adverse decisions of the examiners.

The fee for registration of attorneys shall be \$5 and yearly dues \$1. Attorneys shall be examined as to their qualifications to practice by a board consisting of three officers of the patent office and three attorneys of well-known standing. The qualifications include 2 years' experience in the patent office or with a duly registered attorney or equivalent experience. Censorship over advertising to be used by attorneys is provided.

The printing entailed upon the department is much abbreviated by the bills. Patents shall run for 17 years, giving the exclusive right to make, use and sell to the patentee and his assigns and shall be limited to expire 19 years after the filing of the application, except that allowances will be made for actual time lost in considering the application. In no case shall a patent be in force for more than 17 years.

After 4 years, in case a patented article is not manufactured to an adequate extent, any person demanding it shall be entitled to a license to manufacture, unless the patentee can show sufficient cause for inaction. The courts are authorized to arrange terms.

All applications for patents shall be completed for examination within 6 months after filing. Unrestricted use is provided for patented devices in the hands of purchasers.

The amendment contained in the senate bill that is not in the house resolution is as follows:

"That whenever an invention described in and covered by a patent of the United States shall hereafter be used by the

## Two Bills Just Introduced into Congress Intended to Regulate Inventions

United States without license of the owner thereof or lawful right to use the same, such owner may recover reasonable compensation for such use by suit in the court of claims; provided, however, that said court of claims shall not entertain a suit or reward compensation under the provisions of this act where the claim for compensation is based on the use by

the United States of any article heretofore owned, leased, used by, or in the possession of the United States; provided, further, that in any such suit the United States may avail itself of any and all defenses, general or special, which might be pleaded by a defendant in an action for infringement."

## HOOSIERS QUESTION TAG LAW

Indianapolis, Ind., April 22—Several members of the Hoosier Motor Club have brought suit in the circuit court to enjoin the city from enforcing the new motor car license ordinance. The new ordinance provides a sliding scale of license fees, ranging from \$5 a year for a runabout to \$15 a year for trucks of 3 tons' capacity and over. Formerly all motor cars were charged \$3 a year, regardless of size or classification.

It is alleged in the suits filed that the ordinance is unconstitutional, in that the license fees are designed for revenue instead of as a license for using the streets. It also is termed class legislation, and it is pointed out that owners already have complied with the state registration law and have listed their machines with the township assessor for taxation. The law becomes effective January 1.

## SANTA MONICA ENTRIES

Los Angeles, Cal., April 20—Entries to the Santa Monica road races, to be run May 4, close next Thursday, when it is expected the list will be considerably larger than it now is. In the free-for-all, the big race, there are eight entries at present—three Fiats, with Oldfield, Bragg and Tetzlaff for drivers; Bruce-Brown's Benz, de Palma's Mercedes; Dingley's Simplex, Marshall's Napier and Lewis' Stutz. The National is expected to come in with two. In the 231-300 class there are two Mercers, with de Palma and Jeffkins for drivers; two Cases, with Oldfield and Disbrow up; Nikrent's Buick, Shayne's Schacht and Siefert's Midland. In the 161-230 class there are entered two Fords, three Flanders, a Reo, Regal, Maxwell and Buick.

## NINETEEN IN QUAKER RUN

Philadelphia, Pa., April 20—Up to today there had been nineteen entries received for the annual social run and gasoline economy test of the Quaker City Motor Club, which will be run next Saturday to Atlantic City. The winner of the fuel test will be decided by dividing the gasoline consumption as expressed in ounces by the gross weight of the car. The entries so far consist of five Americans, two Wintons, two Packards, three Cases and one each of the Lozier, Marion, Interstate, Kline, Columbia and Oldsmobile. Fifty are expected to contest.

## Coming Motor Events

- \*April 15-20—Track meet; Birmingham, Ala.
- \*April 27—Roadability run, Philadelphia to Atlantic City, Quaker City Motor Club; Philadelphia, Pa.
- April 27—Speedway race; Los Angeles motordrome; Los Angeles, Cal.
- April 29-May 4—Annual show Burlington, Vt.; Merchants' Protective Association.
- May 4—Hill-climb; Atlanta, Ga.
- \*May 4—Road Race; Motor Car Dealers' Association; Santa Monica, Cal.
- May 12—Track meet; Salt Lake City, Utah.
- May 18—Sociability run at Washington, D. C.
- May 17-18—Track meet; Colorado State Automobile Association; Denver, Colo.
- \*May 30—Indianapolis speedway, 500-mile race; Indianapolis, Ind.
- \*May 30—Track meet, Rockingham park; Salem, N. H.
- May 30—Track meet, Washington, D. C.
- June 6—Reliability run; Washington Post.
- \*June 8—Track meet; Quaker City Motor Club; Narbeth, Pa.
- June 15—Track meet; Belmont Motor Club; Narbeth, Pa.
- \*June 20—Algonquin hill-climb, Chicago Motor Club; Algonquin, Ill.
- \*June 20-22—Reliability run, Pine Tree Motor Contest Association; Portland, Me.
- June—Reliability run; Auto Club of St. Louis, St. Louis, Mo.
- June—Hill climb; Maine Automobile Association; Portland, Me.
- June 27-28—Interclub match, Chicago Athletic Association and Chicago Athletic Club.
- June—Track meet; Baltimore, Md.
- June 27-29—Summer meeting Society of Automobile Engineers; Detroit, Mich.
- July 4-5—Track meet; Taylor Automobile Club; Taylor, Tex.
- \*July 4-6—Beach meet; Old Orchard Automobile Association; Old Orchard, Me.
- July—Reliability run; Maine Auto Association.
- July—Reliability run; Cleveland News.
- July—Road race; Riverhead, L. I.
- July 4—Track meet; Petersburg, Ind.
- July 5-6—Road Race; Montamara Festo Auto Com.; Tacoma, Wash.
- July—Reliability run; Cleveland News.
- July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.
- July 15—Reliability run; Wisconsin State Automobile Association; Milwaukee, Wis.
- \*August 8-10—Galveston beach meet; Galveston, Tex.
- \*August 23-24—Road races; Chicago Motor Club; Elgin, Ill.
- \*September 2—Speedway meet; Indianapolis, Ind.
- September—Track meet; Universal Exposition Co., St. Louis, Mo.
- Sept. 23-Oct. 3—Rubber show, Grand Central palace, New York.
- October 5—Fairmount Park road race; Quaker City Motor Club; Philadelphia, Pa.
- \*October 7-11—Chicago Motor Club reliability run; Chicago.
- October 12—Track meet; Rockingham park; Salem, N. H.
- November 6—Track meet; Shreveport Automobile Club; Shreveport, La.
- \*Sanctioned by A. A. A.

# Dominion Checks Up Motor Business

**Canada Heaviest Customer of Uncle Sam in 1911, Spending More than \$5,000,000 for Cars and Parts—Neighbor to Our North Takes \$2,458,177 Worth of Tires**

**M**ONTREAL, April 20.—This is the time of the year for government and other statistics concerning exports and imports of motor cars, tires, accessories, etc. Generally about the third month come annual totals and figures, some of which not only make interesting reading but give in cold numerals the exact condition of the market, and also go to show how the relationships of different countries are continually changing in the matter of motor car trade.

Although Canada remained the heaviest customer of the United States during the year 1911, this country did not keep up its record of continued large yearly gains, taking only 10 per cent more in cars and parts from the U. S. A. than in the preceding year, the figures being \$5,021,043 in 1911, and \$5,549,998 in 1910. In 1910 Canada increased its imports from United States by more than 100 per cent or over \$2,500,000. This does not mean that this country is falling behind in the race. Canada now produces a great many more cars right within its own confines, which fact, in a great measure, accounts for the apparent big difference in purchases.

## American Exports

The United States statistics show a remarkable gain in exports to the British island possessions, the shipments last year to British Oceania being three times as great as they were in 1910. Great gains also were made in the exports from the U. S. A. to Great Britain, the total for last year well more than \$3,000,000, as against \$2,755,592 the year previous. The total number of motor cars shipped from the United States during the last calendar year was 15,807, of which 4,987 came to Canada, 4,021 went to the British isles, 2,476 to British Oceania, 1,116 to South America, only 813 to Asia and 420 to France. Thus it can be figured out that the British empire is the greatest customer the American manufacturers have, for more than two-thirds of the motor car exports of the states go to the empire. During last December Great Britain bought no less than \$638,000 worth of cars from the states, surpassing even the Canadian total for the month, \$412,313.

A feature of the market situation is that Canada does comparatively little exporting, its domestic demand being sufficient to keep its manufacturers busy. At that one of the most popular cars in Australia is a Canadian product, and nearly half the consignments of this country go to Australia. The United States also takes a few cars from our makers. Last year there were exported more than \$700,000

worth of cars from the dominion, or, speaking numerically, about 900 machines. The United States imported 173 cars from Great Britain last year, which is a fairly good showing, all things considered. France finds the more ready market in the American republic, however, although its trade with the states is gradually diminishing. In 1911 France sent 341 cars to the land of the stars and stripes, whereas the total for the previous year was 556, and in 1909 the aggregate was 928, which means that French cars are becoming less popular in the republic. American import figures are continually growing less, the total of 972 cars for last year being fifty-two fewer than in 1910 and 652 fewer than in 1909.

Exports of internal combustion engines for use in motor cars from the United States are steadily assuming greater importance, Canada taking a larger number of motors for cars built on this side of the border. During the 6 months ending December 31 the United States sent abroad 1,694 engines of the gasoline type, valued at \$204,000, the shipments during December alone figuring up to 448 motors.

Tire exports from the United States during last December were valued at \$200,450 as compared with \$144,645 during the corresponding month of 1910. For the full year of 1911 the value of exported tires is given at \$2,458,177, no comparison being available with the preceding twelve-month, as the government did not list motor car tires separately before July, 1910. Despite the increase in the number of cars manufactured in Great Britain, the statistics issued by the British government show that foreign-made cars still find a ready market in Great Britain and that the export of English-made cars, while growing, is behind the import of foreign cars.

## Exports from Great Britain

During the 12 months of 1911 there were exported from Great Britain 4,539 complete cars valued at \$9,025,126; 733 chassis valued at \$1,476,446, and parts valued at \$5,427,015, a total of \$15,928,585. In the preceding year the exports amounted to 3,555 completed cars valued at \$6,884,430, 564 chassis valued at \$1,067,680, and parts to the value of \$5,076,525, a total of \$13,027,635, representing a gain of \$2,900,950, or 23 per cent. For the month of December alone the export figures show that 464 complete cars valued at \$904,105; 80 chassis, \$154,380, and parts valued at \$429,825, were sent abroad, a total of \$1,488,310 worth of manufactures. These figures indicate slight gains over the same month of the preceding year, 1910.

Large as are these exports they are only a little more than one-half of foreign-made cars, chassis and parts, the total for the year 1911 being 6,778 cars valued at \$8,589,915; 6,672 chassis valued at \$8,619,445, and parts valued at \$12,766,820, a total of \$29,976,180.

For the year 1910 the respective figures were 4,576 complete cars valued at \$7,199,810; 6,553 chassis valued at \$8,357,965, and parts valued at \$10,116,365, a total of \$25,574,140, the 1911 imports representing a gain of \$4,402,040, or 17 per cent over those of 1910.

## Average Value of Imported Cars

The average value of cars imported in 1911 figures out at \$1,988 and that of the chassis \$2,014 as against \$1,837 and \$1,899 respectively in 1910. The average value of imported cars in 1911 amounted to \$1,267 and that of the chassis \$1,292, as against \$1,573 and \$1,275 respectively in 1910.

Manufacturers of cars in Canada today represent an investment of around \$10,000,000, and there are fourteen factories all working up to capacity and all in Ontario. Most of these factories do not make all of their products themselves but import many of the parts from the United States and assemble them in Canada. Last year it was estimated that 5,000 cars at least were made by Canadian factories.

## SITUATION IN SYRACUSE

Syracuse, N. Y., April 20.—This practically is the home of the air-cooled car industry, three manufacturers producing this type of car, the H. H. Franklin Mfg. Co. building both pleasure and commercial cars, while the Chase Motor Truck Co. and the Sanford-Herbert Co. confine their efforts to commercial cars. The H. A. Moyer Co. is the only car manufacturer in Syracuse building the water-cooled type solely.

A sales report recently issued from the office of the Franklin Automobile Co. shows that sales at the branch houses maintained by the company are already 14 per cent in excess of the sales last year at this time, while among the majority of the dealers the present sales total from 100 per cent to 300 per cent more than last year at this time.

The Franklin factory has been running at capacity throughout the winter. Not only has the main plant been taxed to its limit but two additional plants have been required to take care of the output. Plans are well under way to increase the present possibilities for production. The production of a light delivery wagon and increased facilities for making Franklin taxicabs are among the more immediate increases to be made.

At the factory of the H. A. Moyer Co., the production capacity has been doubled within the past year. This is the third year in which the Moyer company has



# Revolution Upsets Car Trade in Mexico

built and sold motor cars and the sales development work of the past year has resulted in a large number of new agencies being established throughout the east. The Moyer factory has been working most of the winter on an overtime schedule to keep up with orders.

At the factory of the Sanford-Herbert Co., which builds 1-ton delivery trucks in two models, business conditions are of the best. This company is now producing trucks in both air-cooled and water-cooled types. Normal conditions prevail at the factory of the Chase Motor Truck Co., it is reported.

## NORTHWEST OUTLOOK BRIGHT

Portland, Ore., April 20—Reports coming from country agents indicate that the entire northwest is destined to prove a rich field for dealers the coming season. Even at the present time, when roads in the country districts are not very good, the small town agents are doing a record business. Crop conditions and the general prosperous air noted in the country towns of Oregon and Washington and Idaho indicate that the present rate of country sales will continue through the summer.

Dealers relying on volume of sales for their legitimate profit will find a welcome help from the small town distributors. The country agents are filled with enthusiasm over the outlook and there are few who are not figuring on doubling their sales of last year.

## AFTER INCREASED EFFICIENCY

Detroit, Mich., April 22—Cutting down the working time without decreasing the output and at the same time increasing the efficiency of the working force is an experiment the Hupp Motor Car Co. is about to put into practice. Factory Superintendent Clarence T. Hillis has issued an order, effective April 25, whereby all employees will go on a 9-hour schedule at a 10-hour wage scale. This practically means an increase in pay of 11.17 per cent for the employees and the action is entirely voluntary on the company's part.

The company's new plant is about the last word in factory construction. It is well lighted and ventilated, there is a commodious restaurant, capable of accommodating 400 persons at one time and the entire plant is fitted with every device known to modern science. With these conditions it is believed that the increased efficiency will more than compensate for the loss of 1 working hour. At any rate the company is going to give the plan a trial for some time.

## VAN COMPANY CHANGES HANDS

Grand Rapids, Mich., April 20—The Van Motor Car Co., of Grand Haven, has been purchased by H. M. Pierce, J. A. Owen and Mrs. L. M. Strong, of this city, who also own the Wealthy Heights garage.

## Disturbances Spoil Business in Republic, Many Men of Wealth Leaving Country to Await Return of Peace—Growth in Demand for Trucks—Madero Improving Roads

CITY OF MEXICO, MEXICO, April 20.

—It is stated by motor car dealers that the revolutionary disturbances in various parts of the republic have caused a large falling off in the motor business not only in this city but in all the cities and towns of the country.

Many men of the wealthy class, particularly large land owners, have left the country pending the restoration of tranquility. Dealers were just beginning to find this element of citizens a good source of trade when the internal strife put a stop to the business. But for the turmoil which many parts of the country is now experiencing this year's motor car sales probably would have been much larger than any previous year. Widespread interest in the cars was being awakened all through the republic.

One of the features of the motor car business in Mexico that has suffered to a much lesser degree than the trade in pleasure cars is the sale of motor trucks. There has been a steady growth of this branch of the business in this city ever since the first of the business vehicles was introduced here.

If President Francisco I. Madero is able to carry to fulfillment his plans for various kinds of internal improvement many miles of good roads will be constructed during his administration. President Madero is a devotee of the motor car as a pleasure-giving vehicle. At his direction the federal department of communications and public works is preparing plans and specifications for the reconstruction of several of the famous old Spanish highways that long have been in a state of disuse. One of these ancient roads runs between this city and Vera Cruz. It is to be placed in a state of first class repair and made available for motor tourists. Another of the old-time highways runs between the capital and Cuernavaca, which latter city was the summer home of Cortez and later used for the same purpose by Maximilian. This road was brought to a fair state of restoration through the efforts of motor enthusiasts a few years ago but it is proposed to make still further improvements to it.

The splendid highway for motor cars that was constructed during the latter days of President Diaz administration between Balsas and Chilpancingo, capital of the state of Guerrero, at a cost of about \$600,000, has been partly destroyed by bands of revolutionists during the last few months. New bridges will have to be erected and other improvements made to the road before it is again passable

for motor cars or other wheeled vehicles.

It is in the mountain districts particularly that President Madero has in contemplation the construction of extensive systems of good roads. Many narrow burro trails are to be widened and made available for motor travel.

## WAR DISTURBS GUAYULE INDUSTRY

Torreón, Mexico, April 20—Revolutionary disturbances in the guayule rubber-producing district in the states of Coahuila, Durango and Zacatecas have caused almost complete suspension of that industry. Owing to the unsettled condition of affairs, not only in the matter of obtaining the services of a sufficient number of laborers but in the movement of railroad traffic, the Intercontinental Rubber Co. closed down its large guayule rubber manufacturing plant here recently, and it is uncertain as to when it will be started up again. There has been a great falling off in the gathering of the wild guayule shrub during the last few weeks and the factories that are still in operation are running short of the raw material from which to manufacture the crude rubber.

The report that the Intercontinental Rubber Co. is negotiating for the purchase of the extensive holdings of the Madero family, embracing several millions of acres of land upon which the guayule shrub grows, and several factories were again revived recently, but confirmation of the alleged pending transaction is lacking at the present time.

It is expected there will be a general resumption of the guayule rubber industry on a larger scale than ever before if the revolutionary troubles are settled and the country is brought to a state of tranquillity with an assurance that foreign interests and investments in the republic are to be protected.

## CHILI IN THE MARKET

Santiago, Chili, March 30—Importation of motor cars already is showing a marked increase due to the lowering of the customs duty. Sixty per cent ad valorem has been charged but February 12, by act of congress, the rate of collection was changed to 15 per cent. The principal cities of this republic have finely paved streets and there is a field of importance offered to dealers in motor cars. Cars in use are largely of European make.

## GENERAL MOTORS LISTED

Chicago, April 22—The General Motors Co. has been admitted in the unlisted department of the Chicago stock exchange, and will trade in common and preferred stocks, also 6 per cent notes of 1915.

## Talks A. A. A. Tour Start Executive Committee, Meeting in Buffalo, Says Detroit or Indianapolis

**B**UFFALO, N. Y., April 23—At a special meeting of the members of the executive committee of the American Automobile Association, held in the Lafayette hotel here on Thursday, April 18, a special committee was appointed to determine the starting point for the annual national reliability tour of the A. A. A. It was decided to name either Detroit, Mich., or Indianapolis, Ind., for the starting point, but the decision will not be made known for several weeks.

President Robert P. Hooper of Philadelphia presided at the meeting, which was attended by twenty-three other directors of the A. A. A. Four large organizations were added to the national strength of the A. A. A. They are: Kansas State Automobile Association, with seven clubs; Hoosier Motor Club, Indianapolis, Ind.; Tacoma Automobile Club, Tacoma, Wash.; Paducah Automobile Club, Paducah, Ky. The following state associations reported increases in membership at the Buffalo meeting: Pennsylvania, with seven clubs; Iowa, three; Massachusetts, three; Virginia, two; New York, two; Ohio, one; New Jersey, one; South Dakota, one; Texas, one. Two hundred and five individual members were admitted, most of whom live in New York city. W. M. Sweet of New York city and Stedman Bent of Philadelphia were added to the executive committee of the A. A. A.

George C. Diehl, chairman of the good roads board of the A. A. A., made a report on the good roads propositions that are now being considered by the government. Recently Mr. Diehl appeared before the rules committee of the house of representatives and, with other motorists, advocated the Underwood resolution that contemplates the improvement of many national highways. The resolution provides for federal aid, and the committee is standing for anything that is being done for the improvement of the highways. The committee also considered the bill of Senator Heyburn, declared Mr. Diehl, for improvement of highways in Yellowstone park, a government reservation. This highway ought to be improved so that motorists would find it usable, stated Mr. Diehl.

There was considerable discussion among delegates from the cities of Cincinnati and Cleveland relative to changing by-laws so that a person may vote a proxy. The rules are such that the proxies can be voted only by a delegate from the state in which the proxy-giver lives. Cleveland is satisfied with the present rules, but Cincinnati is after the change. The matter will probably be determined at the next meeting of the executive committee of the A. A. A. The question of establishing a national headquarters at

Washington, D. C., was referred to a special committee, which also will make its decision known at the next meeting of the executive committee.

At the close of the meeting the following resolution was adopted by the executive committee of the A. A. A. relative to federal registration:

"Resolved, That in the opinion of the A. A. A. executive committee, a federal registration act is not only unnecessary at the present time, but against the interest of the motorists of the different states; that the imposition of an additional tax for said federal registration would be an unfair and unreasonable discrimination against the users of motor cars and that we consider the passage of such a law as most unjust."

## BISONS HOLD BANQUET

Buffalo, N. Y., April 22—"More Good Roads" was the subject of the addresses at the first annual banquet of the Automobile Club of Buffalo at the Hotel Lafayette on Thursday evening, April 18. The banquet was a great success, 200 motorists enjoying the pithy speeches and the atmosphere of good fellowship. Robert C. Hooper, president of the A. A. A., and of the Pennsylvania Motor Federation, spoke strongly of the need of federal aid in the building of better highways, and declared that state motor associations could do much toward this end. County Engineer George C. Diehl said that New York state is leading the way in good roads building. Contracts this year for 1,700 miles of improved highways will be awarded in New York state, declared Mr. Diehl.

## LYONS SUCCEEDS RITCHIE

Rochester, N. Y., April 20—The directors of the New York State Automobile Association held their first meeting of the year at the Hotel Seneca here this morning. Frank B. Lyons, of Binghamton, N. Y., was elected secretary of the state organization to succeed J. A. Ritchie, who resigned. An active campaign to popularize the \$50,000,000 state bond issue in the interests of good highways was discussed. After the meeting the directors went to the Genesee Valley Club, where they were the guests of President Charles J. Brown, of the Rochester Automobile Club.

## SPEEDWAY RACE CERTAIN

Indianapolis, Ind., April 22—Rumors to the effect that there might be a postponement of the 500-mile speedway race were set at rest today when the management declared that entries positively will close May 1 and that Carl Fisher has emphatically declared that under no conditions will the race be postponed. This followed the statement that it was intended to keep the entry list open to May 15. The twentieth entry received is that of a Schacht.

## Greenfield Course Liked Milwaukee About Decided on Vanderbilt Circuit—Tentative Entries Made

**M**ILWAUKEE, WIS., April 23—In preparation for the visit of official representatives of the Motor Cups Holding Co. to Milwaukee to investigate the situation and conditions surrounding the running of the road races for the Vanderbilt cup and the grand prix next September, the contest board of the Milwaukee Automobile Dealers' Association and Assistant Secretary Bart J. Ruddle are gathering data and statistics and getting the consent of all interested in any way so that actual preparations may be begun as soon as the easterners put their O. K. on the whole.

Acting on the favorable opinion given by Starter Fred J. Wagner with regard to the Greenfield course, which embraces the Janesville plank, Beloit, Hawley and Smith roads and Lincoln avenue, the dealers are devoting practically all of their attention in matters relating to courses to this circuit. The farmers living along the proposed course are proving to be friendly toward the propositions and not inclined to hold up the dealers on prices for acreage for grandstands and other requirements.

No decision has been made with regard to conducting two races in conjunction with the two main events. The proposed Milwaukee Challenge cup probably will call for a competition for stock chassis under 575 cubic inches piston displacement, and the other trophy, which is believed to have been promised by Colonel Gustave Pabst, will be for light cars, probably under 231 cubic inches displacement.

Many tentative entries have been received by the contest board, among them the Case, Mitchell, National, Kissel, Benz, Fiat, Simplex, Flanders, E-M-F, Mercedes, White and Staver. These tentative entries consist of intimations and actual promises of manufacturers to participate in one or more of the races to be conducted during the September carnival at Milwaukee.

Hotels are already receiving reservations and Manager Ray Smith, of the Hotel Pfister, reported today that the house is more than three-quarters sold for the races. Frank X. Mudd, of the Chicago Automobile Club, on Saturday reserved 100 rooms at the Pfister for a party of Chicago enthusiasts.

## DETROIT PLANS FALL TEST

Detroit, Mich., April 20—The Michigan Agricultural Society will apply for a sanction for a national non-stop motor run for motor cars, to be contested for in and around Detroit next September, while the state fair is in progress. The fair society will offer as a grand prize the Michigan State Fair trophy and it is planned to make the run an annual event.



## Texas Cup to Chalmers

### San Antonio Daily Light's Reliability Remarkable for Its Strenuosity

SAN ANTONIO, TEX., April 22—Between April 6 and 12 the non-stock reliability tour, held under the auspices of Daily Light, was run off. The route was laid out from this city to Corpus Christi, Port O'Connor and return, a distance of about 697 miles.

A Chalmers runabout received the lowest penalization, being debited 76 points for losing its fan and damaging its radiator in the early stages of the run. A Packard touring car won its class prize with a penalty of 177 points for making various adjustments and for taking on fuel and water. The other three to finish as contestants were touring cars, a Hudson with 646 points for adjustments, lateness and taking supplies; a Buick with 569 points levied for a broken steering rod and a Flanders, 370 for work on its magneto. All the rest either withdrew or were penalized over 1,000 points each, which is equal to withdrawal. The field consisted of fifteen entries.

The first day's run was accomplished without very unusual happenings, but from that point to the finish the tourists underwent nearly everything in the way of weather and road conditions. A tremendous storm broke at the opening of the second day which brought about the withdrawal of the Oldsmobile entry and the disability of several others. When the column finally reached Arkansas Pass it was found that there was such a heavy sea running that it would be perilous to undertake the ferry passage to St. Joseph island. The tour was halted until Tuesday, April 9, when the travelers were obliged to build a bridge over Cedar bayou. This work proved to be useless, as the ferry boats arrived just as the labor was finished and the cars were transported across the bayou on floats.

Accidents were numerous, owing to the storm and the condition of the roads. The Metz went out with a bent steering knuckle, caused by hitting a concealed stump; the Courier broke its frame; the Stoddard lost a wheel; the Staver hit a cow; the Stearns-Knight broke its right rear axle driveshaft, being pulled out of quicksand near Aransas Pass. The Franklin and Marmon were mired and the Pierce pair withdrew without reported reasons.

Despite the bad weather and trying going, Referee R. W. Carr reports that the tour was enjoyable and that it accomplished much good to the industry. The Chalmers car was awarded the Port O'Connor cup in addition to the runabout prize. The scores were as follows:

No.	Car	Driver	Class	Score
1	Chalmers	W. Morrison	R.	76
2	Pierce-Arrow	W. Steinhardt	T.	*
3	Stearns-Knight	F. Armstrong	T.	*
4	Hudson	Chas. Roberts	T.	646
5	Packard	J. Langford	T.	177

6	Stoddard-Dayton	W. C. Mulligan	R.	*
7	Staver-Chicago	F. D. Schultz	T.	*
8	Franklin	A. B. Weakley	T.	*
9	Buick	W. C. Marr	T.	569
10	Flanders	R. Johnson	T.	370
11	Marmon	F. P. Warren	T.	*
12	Metz	C. J. Chahot	R.	*
13	Courier	A. H. Fraser	T.	*
14	Pierce-Arrow	Chas. Noack	T.	*
15	Oldsmobile	F. J. Fielding	R.	*
	R—Runabout	T—Touring car		
	*—Withdrew			

### ARIZONA'S BIG RUN

Phoenix, Ariz., April 20—More than 100 Studebaker cars are entered in the Arizona Motor Co.'s sociability run from Phoenix to the Grand canyon, to be held early in June. Monday, June 3, the cars that are entered will parade through the streets of Phoenix. In the procession will be two Studebaker trucks, which are to be sent along on the run laden with gasoline, oil, spare parts and tires. With the trucks will be a force of five expert mechanics.

The start for the canyon will be made at 7 o'clock on the morning of Tuesday, June 4. The first night will be spent at Prescott, 125 miles distant. Flagstaff, 100 miles farther on, will be the stopping place for the next night, and the canyon, 85 miles from Flagstaff, will be reached the afternoon of June 6.

Two days and three nights will be spent at the canyon. On the night of June 7 the motorists will be the guests of the Studebakers at a banquet, to be held in the dining room of El Tovar hotel. J. M. Studebaker, or some other high officer of the corporation, will be present.

June 9 the motorists will run back to Flagstaff by way of the famous petrified forest. That night they will be tendered a banquet by the people of Flagstaff. Next day they will visit the ice caves, cliff dwellings and other points of interest, running over to Williams in the afternoon. That night the people of Williams will give them another banquet. The next night there will be still another banquet at Prescott. It is expected that all the cars will be back in Phoenix the night of June 12.

### VETERAN AGAIN ON ROAD

Buffalo, N. Y., April 22—The Thomas Flyer, which 4 years ago raced from New York to Paris to maintain the prestige of American-built motor cars, is again on the road. On Saturday it left Buffalo in charge of Neil Mohr and Elmer Miller, factory service men in employ of the E. R. Thomas Motor Car Co. The car will be driven across New York state and into New England territory. The purpose of the trip is to assist the Thomas dealers in the inspection of owners' cars and to see that all Thomas cars are giving the most efficient service.

### TRUCK RUN POSTPONED

Chicago, April 20—The Chicago Motor Club, which had scheduled its second annual commercial vehicle demonstration for the middle of May, has postponed it to fall because of the condition of the roads.

## Pick Grand Prix Pilots

### Many Stars Selected to Drive in French Road Race over Dieppe Circuit

PARIS, April 6—As the cars for the French grand prix race are being rapidly got ready for the road, announcements are being made of the men who will be selected to drive them. The list already drawn up comprises the best racing talent to be found in Europe, and doubtless more distinguished names will be added later.

Lorraine-Dietrich has chosen Victor Hemery and Bablot, this latter being the driver who won last year's light-car race for Delage. The third driver doubtless will be the Dietrich chief tester, and the fourth one has yet to be appointed. The Peugeot team will consist of Boillot, Goux, Zuccarelli, and the ex-racing motor cyclist and aviator, Thomas. The Gregoire company has placed three of its cars in the hands of De Marne, Porporato, and Romano, and has yet to select a driver for the fourth. Guyot, who won the voiturette grand prix in 1908, has been retained to drive one of Rolland-Pilain big cars, and will have as his companion Fauquet, who handled one of these cars in the only race in which this firm competed last year.

Arthur Duray has joined the Alcyon team and will have as his team mates Barriaux and Page. Undoubtedly the 3-liter Sizaire-Naudin cars will be handled by the partners, Georges Sizaire and Louis Naudin, and the third car entrusted to one of the factory testers. Koecklin will drive his own car, an original type of two-cycle. Henry Depasse in all probability will take charge of the Ford car, for which he is the general selling agent in France. Gustave Caillois, formerly a Richard Brasier driver, and for some time with the Thomas company, of Buffalo, has joined forces with the Sunbeam, his companions being Rigal, the selling agent for the firm, and Medinger. The fourth man has not been selected.

The veteran Gabriel has been selected for one of the Cote cars, his companion being De Vere. Hispano-Suiza has selected Pilliverdie and Dery, both of them employed as testers at the Paris factory. Two other men have yet to be chosen. Christiaens, the Belgian aviator, will drive the Belgian Excelsior car. The drivers have not yet been appointed for the three Schneiders cars nor for the Swiss Sigma with the Knight motor.

The Darraq racers are in a very backward condition, and no arrangements have yet been made for the drivers. Calthorpe probably will not start in the race, and the other English firms, Singer, Vauxhall and Arrol-Johnston have not quite completed their teams. As already announced, the Fiat cars will be in the hands of the two American drivers David Bruce-Brown and Ralph de Palma, and the French crack, Louis Wagner.

## WONDERS OF IDAHO PORTRAYED

THE transcontinental motorist is constantly discovering some new and interesting bits of scenery in his travels across the great west, and every year is adding to the delights of touring in this country, emphasizing the See America First movement.

The latest claimant to scenic honors is Shoshone Falls, which is in southern Idaho, 6 miles from Twin Falls. In the early days, when Idaho was spoken of as away out west, and was principally a desert waste, the few travelers who viewed this wonder of nature, had to travel overland in a stage coach from the town of Shoshone, 25 miles distant. The country then was covered with sagebrush and inhabited by jackrabbits and coyotes. Less than a decade ago the Carey act was passed, by which vast tracts of arid land has been reclaimed and changed into prosperous farming communities. The first great irrigation project under the Carey act was the Twin Falls south side tract, consisting of 240,000 acres. This was thrown open in 1904 and the city of Twin Falls laid out in the desert. Like magic this town grew, and it is now the wonder and admiration of eastern visitors, who find paved streets, electric lights, magnificent hotels and all the conveniences of the modern eastern city of 50,000 inhabitants. A railroad into Twin Falls has enabled visitors to get to Shoshone Falls with very little discomfort, and now an electric line is being constructed from Twin Falls direct to Shoshone Falls.

Famous artists have painted the Shoshone Falls, writers and poets have sung its praises, and it is now becoming a mecca for motorists. Last year the Twin Falls County Automobile Club gave a hill-climb up the grade of the Snake River canyon just above the falls, and it discovered that this offered a testing ground without a peer, and the scenic attraction of the falls and the canyon made it an ideal spot for a contest. This year it is proposed to hold a contest here.

The great beauty of Shoshone Falls is in the picturesque setting. Away back in the remote ages a river of fire cut a jagged gash in the face of the earth, and the Snake River canyon remains today to show the awful convulsion of Nature.

## TERRE HAUTE TO DETROIT

Owensboro, Ky.—Editor Motor Age—I am thinking of making a trip to New York this summer and am considering going by way of Terre Haute, Fort Wayne, Detroit and through Canada to Buffalo. What is the best route from Terre Haute to Detroit? What is the arrangement about taking a car through Canada; do I need a license; if so, to whom should I apply for these matters?—H. L. Scharlach.

For Evansville, Ind., you can either motor 30 miles to Henderson, Ky., through Sorgho, Hebbardsville and Zion and ferry to Evansville; or follow a route of 44 miles through Thomston, Yelvington, cross-

# Routes and Touring



SHOSHONE FALLS IS 6 MILES FROM TWIN FALLS, IDAHO. ABOVE THE FALLS SNAKE RIVER CANYON OFFERS SPLENDID GRADE FOR A HILL CLIMB

ing the Ohio river to Powers, Rockport, Hatfield, Yankeetown, Newburg and Evansville. By July the roads will be in fairly good shape.

Evansville to Terre Haute routes through Zipp, Staser, Sturmes, Hamstade, Mt. Branch, King, Princeton, Patoka, Hazelton, Decker, Cantalope, Cypress, Parcell, Vincennes, Emison Oaktown, Carlisle, Paxton, Sullivan, Shelburn, Farmersville, Youngstown and Terre Haute.

Terre Haute to Fort Wayne lies through Seeleyville, Staunton, Brazil, Harmony, Reels, Manhattan, Coatesville, Mt. Meridian, Stilesville, Bellville, Plainfield, Bridgeport, Indianapolis, Cumberland, Greenfield, Maxwell, Eden, Pendleton, Anderson, Muncie, Albany, Fairview, Winchester, Redkey, Peroleum, Bluffton, Fort Wayne. If you do not care to include Toledo in your trip from Fort Wayne to Detroit according to the Blue Book the best routing lies through Maysville, Hicksville, Brunersburg, Defiance, Okalona, Napoleon, Wauseon, Ottokee, Lyons, Adrian, Tecumseh, Clinton, Saline, Ypsilanti, Wayne, Dearborn and Detroit. To pass through Toledo veer east from Napoleon through Perrysburg, and then strike the road outlined above to Detroit at Ypsilanti by motoring through Dundee, Milan and Stonycreek.

You might like to motor to Mt. Clemens and Port Huron before entering Canada. There is a good road to Port Huron and

you travel through pleasant farming country whichever place you enter Canada—Detroit or Port Huron. The Detroit-Port Huron road passes through Roseville, Mount Clemens, Muttonville and St. Clair.

The most simple way to secure Canadian touring privileges is to send \$5 to J. M. Duck, Windsor, Ont., or to A. J. Chester, Sarnia, Ont. They have special arrangements with the Canadian government whereby they are able to furnish bond and customs touring permit for a fee of \$5, no cash deposit being required, which otherwise would be \$25. This per-

## Omaha Club Bulletin

In the semi-monthly bulletin issued to the members of the Omaha Motor Club, attention is called to a new western route, to be marked with red and white bands, which takes in a section of the state between the North and South Platte routes heretofore seldom used by tourists. The road extends directly west from Lincoln over what is known as the O street road for a distance of 19 miles, where it veers northward to Seward, then follows the railroad to Waco and York, passing within a short distance of Tamora and Utica. Continuing westward from York it passes through Bradshaw, Hampton, Aurora, crosses the railroad and Platte river, and enters Grand Island from the south.

The Ashland bridge and road on each side are in fair condition, and the road safe for travel. Between Ashland and Greenwood, and the Platte river bridge, the roads are being dragged and are in fair condition.



# Information



EAGLE ROCK, JUST ABOVE SHOSHONE FALLS. A SUSPENSION BRIDGE WILL BE BUILT OVER THE CANYON, A SPAN OF 1,180 FEET

mit will be mailed you at your home and is good for crossing into Canada at any point on the frontier without formality.

Leaving Port Huron on the ferry you land in Sarnia, Ont., and Continue to Kertch, Warwick, Adelaide, Lobo, Hyde Park, London, Thamesford, Ingersoll, Beachville, Woodstock, Brantford, Cainsville, Ancaster, Hamilton, Stony Creek, Grimsby, Beamsville, Jordan, St. Catharines, Homer, St. Davids, Stamford, Niagara Falls.

Headed towards Buffalo pass through La

## on Roads and Bridges

The river has washed away the approaches to the small bridges, but they ought to be in place soon. The road across the bottom of north side of the river is in bad condition, with the road washed away and bridges gone. However, the bridges are being replaced, and conditions bettering daily. The Louisville bridge can not be used for two or three weeks, as nine spans are missing. The roads leading up to it are in good shape. The Plattsmouth bridge needs two steel spans replaced before it can be used.

To reach Nebraska City and the southeastern part of the state go by way of Pacific Junction, Ia., on the east side of the river. This road is good, and bridges in the vicinity of Nebraska City are in good shape.

The only available route to Fremont and beyond is by way of Arlington. The bridge at Waterloo is intact, but grades are bad, and a lake has formed on the road at Valley, necessitating a detour of a mile or more to the north to get into that town.

Salle, Tonawanda and Gates Circle. There are numerous ways to reach New York, but probably the road most traveled over is that to Williamsville, Clarence, Pembroke, Batavia, Byron, Bergen, Churchville, Rochester, Fairport, Macedon, Palmyra, Newark, Lyons, Lock Berlin, Clyde, Savannah, Port Byron, Weedsport, Elbridge, Camillus, Syracuse, Fayetteville, Manlius, Oran, Cazenovia, Nelson, Morrisville, Pine Woods, Bouckville, Madison, Bridgewater, West Winfield, Richfield Springs, Springfield, Cherry Valley, Sharon Springs, Sharon Center, Carlisle, Sloansville, Esperance, Duaneburg, Dunnsville, Schenectady, Albany, Coeymans, Coxsackie, Athens, Catskill, Cementon, Evesport, Malden, Saugerties, Kingston, Wilbur, Eddyville, Esopus, New Paltz, Plattekill, Newburgh, ferry across Hudson, continuing to Peekskill, Montrose, Croton, Ossining, Scarborough, Tarrytown, Hastings and Yonkers.

From Syracuse, N. Y., you might care to take in Cardiff, Tully, Cortland, Marathon, Lisle, Whitney Point, Binghamton, Hartford, Glenwood, Scranton, Elmhurst, Stroudsburg, Delaware Water Gap, Portland, Delaware, Bridgeville, Burtsville, Hackettstown, Chester, Morriston, Springfield, Newark, Jersey City, New York. Still another route from Binghamton, is Windsor, Deposit, Hancock, Roscoe, Liberty, Greenfield, Ellenville, and Newburg.

## TOURING IN PROVINCE OF CANADA

CASS CITY, Mich.—Editor Motor Age—I would like a route from St. Paul to Winnipeg, then to Regina, Moosejaw, Saskatoon, Edmonton.—W. A. Seegel.

The first day from St. Paul to Alexandria is through Lyndale, Robinsdale, Osseo, Anoka, Elk River, Big Lake, Becker, Clear Lake, Cable, St. Joe, Avon, Albany, Freeport, Sauk Center, Osakis, Alexandria. To Fargo, N. D., the route takes you through Garfield, Brandon, Evansville, Melby, Ashby, Dalton, Fergus Falls, Rothsay, Barnesville, Baker, Fargo.

Fargo to Winnipeg routes through Georgetown, Halstad, Shelley, Neilsville, Climax, Eldred, Carmen, Mallory, Grand Forks, Ardock, Minto, Grafton, St. Thomas, Hamilton, Pembina, crossing the boundary line to Emerson, Letellier, St. Jean Baptiste, Morris and Winnipeg.

Winnipeg, Man., to Regina and Saskatoon, Sask., by the shortest route takes you through the older settled districts of Manitoba, traversing to White Plains, Kirkville, Newton, Portage La Prairie, Bagot, Austin, Carberry, Sewell, Douglas, Chater, Brandon, Kemnay, Alexander, Sommerville, Oak Lake, Finden. Through Saskatchewan the towns are Wawota, Francis, Sedley, Kronau, Richardson, Pilot Butte, Regina, Condie, Craven, Lumsden, Bethune, Findlater, Chamberlain, Ayelsbury, Craik, Davidson, Bladworth, Kenaston, Henley, Dundurn, Nutana and Saskatoon. Headed for Edmonton, Alb., the itinerary is Dalmeny, Langham, Borden, Radisson, Fielding, Maymount, Ruddell, Denholm, Brade, N. Battleford, Delmas, Bressaylor, Paynton, Birling, Maidstone, Waseca, Lashburn, Marshall, Sisley, Aberfield, Lloydminster, Blackfoot, Islay, Borradale, Vermillion, Claysmore, Manville, Minburn, Innisfree, Ranfurly, Lavoy, Raith, Mundare, Chipman, Beaver Hills, Oliver, Edmonton.

Regina to Moose Jaw is, but a short distance, and an optional route to Edmonton is through Bonharm, Caron, Mortlach, Parkberg, Secretan, Chaplin, Ernfold, Morse, Herbert, Fish Lake, Waldeck, Aikins, Swift Current, Seward, Webb, Antelope, Gull Lake, Carmichael, Sidewood, Crane Lake, Colley, Maple Creek, Kincaith, Forrest, Cummins, Walsh, Irvine, Dunmore, Medicine Hat, Whitla, Winnifred, Bow Island, Burdett, Wetwold, Woodpecker, Chin, Coaldale, Lethbridge, Kop, Pearce, McLeod, Leavings, Claresholm, Stavely, Nanton, Cayley, Gladys, Chotoks, Midnapore, Calgary, Beddington, Airdrie, Crossfield, Carstairs, Didsbury, Olds, Bowen, Penhold, Red Deer, Waghorn, Lacombe, Ponoka, Holbroke, Hobbem, Millet, Deduc, Stratheona and Edmonton.

This circuit is the one over which a pathfinder was sent for the Canadian tour last year, but on account of road conditions a tour was postponed. Many bridges had been washed away. It is doubtful if you can make the short trip from Saskatoon to Edmonton.

# Massachusetts' Methods Of Examining Chauffeurs

TABLE GIVING STATISTICS ON EXAMINATIONS OF BAY STATE

The following figures give the totals each year except in 1907, the first year when the examinations covered but a few months:

	1908	1909	1910	1911
Total number of examinations.....	3,290	4,629	5,433	6,152
Total number of persons examined.....	2,666	3,473	4,138	4,648
Total number passed.....	2,379	3,149	3,701	4,119
Total failures, first examination.....	730	1,098	1,268	1,424
Total failures, first examination (road).....	559	1,044	1,263	1,496
Total failed to get license.....	287	324	437	529
Per cent failed to get license.....	10.76	9.33	10.56	11.38
Per cent failed, first examination.....	27.38	31.61	31.50	31.53
Per cent failed, first mental examination.....	11.25	9.93	8.60	8.63
Per cent failed, first road examination.....	16.15	21.68	22.90	25.11

MASSACHUSETTS perhaps was the first state to take official cognizance of the fact that the men who operate motor cars, especially those who drive for pay, should prove that they were duly qualified for the work. The highway commission first made it a point that none should get a license who had not driven at least 100 miles, and this rule still applies to private owners.

However, it was the professional chauffeurs that the commission was more interested in, because they were on the road at all times, and so in 1907 the commission in its report to the legislature recommended that a law be passed examining chauffeurs. This was done, and it went into effect in April of that year. Immediately the commission appointed Fred L. Austin and C. G. Hubbell as examiners.

## Preparing Examination Papers

They began their task at once. It was decided upon by the commission that the chauffeurs should be examined as to their intelligence as well as to their mechanical qualifications. So a series of twenty-five questions was framed up, based upon the law of the road, the motor laws, the rules and regulations of the commission referring to the licensing and registration of chauffeurs. A diagram in the center of the paper allowed for the marking to show whether the applicant knew the direction in which to go. Then came the road test. So began the operation of a law that has worked out remarkably well in the Bay State.

There have been changes from time to time to meet exigencies, of course. Here is how the work is done at present: An applicant for a license to operate a motor car sends in his application and incloses \$2. He then is notified when and where he can be examined. In Boston there are examinations every day except Sunday. But in order to make it convenient for applicants throughout the state, other examinations are held at Pittsfield on Mondays; Springfield, Worcester and Fitchburg, on Tues-

days; Brockton, Fall River, and New Bedford, Thursdays; Lowell and Salem, Fridays. This gives a chain of ten cities for the six examiners.

Once having sent in his application the written examination is given as soon as the applicant wishes. In the early days it did not take long for the chauffeurs to memorize the questions, and if they did not pass at first they soon looked them up and got the answers right. Then they posted other applicants. But the examiners noted, too, that there seemed to be a remarkable similarity about the answers and they realized that the applicants were being coached. So a change was made.

Today there are six different sets of questions, and some of these are changed from time to time, so that an applicant never can tell just what he is going to be asked about. Moreover, there are but twelve questions now instead of twenty-five, as formerly. However, the commissioners reasoned out that the practical work was what should count the most, and so the questions are not framed up to tangle up the applicant, but to get some idea as to whether he has given the matter of operating a car the serious consideration it needs other than the mechanical features. But the road test has been made more severe, which accounts for the many failures to pass.

## Test for Drivers

So the questions embody subjects as to the operator's attitude to other users of the highway; the handling of a car where there is much horse-drawn traffic; the proper care of license, registration certificate, number plates; the lighting of lamps, and other safeguards; questions about speed, etc. The applicants are requested to fill out the answers in the presence of some official and the papers then are looked over before the person leaves. If any answers are not given to questions the applicant is queried about it and the matter gone into. Naturally, more attention is paid to the answers to questions

relative to reckless operation and excessive speed than some of the other ones.

Then there follows the road test. This is naturally the more important. So observing have the examiners become that they can tell at a glance when the applicant enters a car whether he is nervous or is immature in his knowledge of motor cars. Each applicant must furnish the car in which the test is to be made. In the early days the applicants came from made-to-order-quickly motor schools, and as they did not have any too much money they were forced to hire cheap cars. The schools, too, not wishing to take chances letting the students take out good cars were palming off any old rattletrap. The examiners, after a while, finding that they had to ride on running boards so as to be able to leap off when a driver lost control on a hill, or the brakes refused to hold, decided that the position did not call for their jeopardizing their lives, so they got the commission to pass a rule that all applicants should produce a car that was modern and which would not get beyond control. So now the best makes of cars are used.

## Work of the Examiner

The would-be chauffeur in Boston drives up to the headquarters of the highway commission near the state house and a time is assigned him to be ready. An examiner comes out, jumps in and tells the applicant to start along. Generally the latter has some one with him to give him confidence. The examiner has noted the condition of the car as it stood on the street; how it was facing; its relative position to other cars and the curbing, so as to its getting under way easily. He has noted the position of the brakes and the control levers, and as the driver gets going the manner in which he handles the car in the first few hundred feet down the grade to Beacon street determines the examiner as to where he is going to order the driver to go. If the examiner has doubts as to the operator's skill he sends him down Beacon street out toward the Fenway, where there is lots of room. This is generally done, anyway, in the case of an applicant's first trial, unless it is someone who has handled cars in other cities and is familiar with them.

Then begins the orders to turn here; stop there; change from one gear to another; apply the brakes; back up; in fact, do everything a driver may be expected to do ordinarily. If the applicant shows his familiarity with everything and gives evidence that he is really capable, a turn is made downtown into the business districts. This is where the operator must show his real mettle, for the streets are narrow; traffic is congested; there are lots of rules and regulations to be obeyed. The examiner does not need to give any orders other than to state where to go, for the driver will have to be very efficient to get along without trouble. The trip back to the highway commission's headquarters



then is made, the time consumed varying from half an hour to an hour. That done the applicant goes away without knowing whether he has passed or not.

If he has gone through without any trouble he is notified and gets his certificate quickly. Should he fail, he must wait for 2 weeks before he is given a second examination. The examiners believe that a man must be thoroughly qualified to handle a car, because the danger of accident is increased with every registration and each additional driver handling cars, so they never hesitate when in doubt, but decide against the applicant. That is why so many fail the first time. After a second examination, if the applicant is still unfit, he is again turned down. It may be that he can handle all the levers easily and with much skill, but he may have a habit of not showing consideration for pedestrians, either those standing on crosswalks or getting on or off electric; or he may neglect to take the proper side of the road and dodges in between other vehicles by a close shave to show how he can get by, thereby indicating that he may be willing to take chances if licensed; or he may not have a knowledge of the speed at which he is traveling, any one of which things may cause his being turned down, although he does not realize it, believing that it must have been some fault with his handling the mechanical features of the car. This shows a spirit of not reasoning out things on the part of the applicant and it costs him an extra \$2, for he has to pay that sum over each time.

#### Several Trials Permitted

A second failure makes it necessary for him to wait a month before being allowed a third try. By that time he generally makes up his mind to go about the operation of a car properly and fits himself for it better than ever, for a third failure means a wait of three months. This is not necessary in many cases, however, but there have been some. Of course, if the applicant possesses any infirmity this is disclosed in the application blank.

In the case of a private owner, if he has any infirmity, the commission directs that the examiners look him up to be sure that he is capable. There are not set rules for preventing a person becoming a driver, but one may readily understand that if there is a possibility of the person being liable to lose control of a car he is not allowed a license.

#### Age Limitation On

This rule was brought about by some accidents, in one of which, at least, the fact was brought out that the driver was a cripple, and in another the driver was very young. So an age limitation is now set upon licenses so that no one under 16 may get a private operator's license or anyone under 18 a professional license. All licenses are good for 1 year from the date of being issued. The fee for a license is \$2, and this does not include the examination fee. Renewals cost 50 cents.

# Accidents in Bay State Probed by Investigators

TALE OF STATISTICS OF MASSACHUSETTS ACCIDENTS INVESTIGATED

	1908	1909	1910	1911
Investigations .....	59	241	429	504
Prosecutions .....	3	33	47	39
Number of hearings.....	75	155	197	240
Licenses suspended or revoked.....	96	200	283	360
Causes—	1908	1909	1910	1911
Reckless operating .....	40	81	50	41
Under influence of liquor.....	13	23	22	14
Accidents resulting in death.....	9	44	57	95
Improper operation .....	18	10	88	137
Refusing to stop after accident.....	5	8	9	8
Three convictions for overspeeding.....	4	11	8	2
Operating without owner's consent.....	4	13	23	24
Sundry offenses .....	7	10	26	18
Total .....	96	200	283	360
Court abstracts received.....	2,570	4,271	3,706	3,322
Persons found guilty.....	2,360	3,892	3,328	2,911
Accidents—	1908	1909	1910	1911
Total number killed.....	13	54	77	110
Total number injured.....	486	989	963	1,248
Total number of accidents.....	607	1,130	1,182	1,531
Accidents in daylight.....	379	826	867	1,098
Accidents after dark.....	228	304	315	433
Accidents on country roads.....	214	314	222	280
Accidents on city or town streets.....	393	816	960	1,251
Total number of cars registered.....	18,052	23,971	31,360	38,907

ONE of the most important functions of the Massachusetts highway commission is the attempt to lessen the dangers of motoring by revoking or suspending the licenses of all persons who are guilty of reckless driving or who prove themselves unfit to handle cars, either owners or chauffeurs. But the commission does not go about it in a haphazard manner. It is eminently fair in its work and hearings are given, for the law allows it, and the entire facts are then brought out.

#### Power Given Commission

The commission noted in its report for the year 1907 that there was a growing tendency toward motor accidents, but not having the power to investigate cases it had to rely upon court abstracts. The law had a provision in it that judges should report cases to the highway commission where persons were found guilty of reckless driving, and the law said that in case of three convictions in any year a license to drive must be revoked. That made it mandatory.

The law gave the commission power to suspend or revoke licenses when it felt that the public interests should be best served by doing so. So when complaints were made the persons were summoned and hearings given. Acting upon the recommendation of the report of the commission in 1908, the legislature finally passed a law giving the commission authority to make investigations, summon

witnesses, etc., and in fact gave the commission judicial powers.

Then examiners were appointed and the real work of investigating began in 1909. Up to that time the commission relied mostly upon the investigations made by the Safe Roads Association, formed by Boston motorists, and whose first president was Colonel W. D. Sohler, now a member of the highway commission. Having had the experience with the work there, he was able to carry it on more successfully as a highway commissioner. The Safe Roads Association investigated accidents and George McC. Sargent, its counsel, prosecuted cases first before the court and later before the highway commission. That was the beginning of a work that has been of much importance in the Bay State.

That the commission was determined to rid the roads of undesirable motorists was apparent by the persistency with which it went about its work. There is one typical case that stands out prominently in this regard that shows the thoroughness of the work. A motorist in one of the Bay State cities had been reported for reckless driving and was cautioned. Later on he figured in an accident in which he killed a pedestrian. The matter was called to the attention of the court, but the motorist was a person of wealth and influence, and so no charges were made.

The highway commission tried to have something done, but in vain. Later on he

figured in another serious accident, resulting in the death of a person, and again the court refused to do anything. The highway commission revoked the man's license, but he promptly hired a chauffeur, and he continued to drive as before. The commission got busy again, and later, when the legislature convened, had an amendment passed to the law providing that no person whose license was revoked should be allowed to drive a car even though accompanied by another. It was a law to fit this specific case and it legislated the man off the highways. Even the district attorney of the district would not bother the man and there was some talk at one time of taking the entire matter to the governor, as the officials were prosecuting minor cases and convicting motorists.

#### Hearings Every Wednesday

Under the present law the commission has set aside every Wednesday as a day upon which motor hearings are given. Naturally, with the big increase in the number of motor cars, the cases of accidents have increased, necessitating many investigations and hearings. The commission is furnished with newspaper clippings, and in addition to these it gets the court records and letters from individuals making complaints. When the reports are gone over and the commission decides something should be done, the motorist is notified; or if his license has been suspended and he desires a hearing he makes the request and the commission notifies him to appear at the rooms in the commission's quarters. Sometimes one commissioner hears the case. Or, at times, all three sit in judgment. At present there are but two commissioners, Colonel Sohier and Frank D. Kemp. As the former is an attorney, and the latter has been mayor of Springfield, both possess judicial qualities, and they are not anti-motorist. In fact, the Bay State commission has won the high regard of the motorists in the matter of hearings as being more inclined to favor the motorists.

The motorist is allowed to present the full facts of the case to the commission, and if the facts warrant it the license is returned to the motorist at once, regardless of the charge against him. But the commission from time to time has made known what it regards as improper driving, and a person must prove very thoroughly that he had his car under control when he figured in a smashup if he wishes to escape suspension or revocation. The commission has let it be known, too, that a car that could not be stopped within a certain distance was not under control, and these things have operated to make drivers careful.

#### Committee a Fair One

That the commission is eminently fair is borne out by some of its reports. In one it states: "The commission wishes to call the attention of the public to the fact



that in very many cases which it has had carefully investigated the accidents happened entirely from careless or reckless action on the part of the persons not in the motor car, who were killed or injured often because they stepped directly out into the street without looking, and from behind some team, post or other obstacle where they could not possibly be seen by the driver of the motor vehicle, and under circumstances where such action would not naturally be expected.

"In many other instances, while the pedestrian was clearly grossly careless, to say the least, the commission has suspended or revoked the license of the operator because he, also, was not as careful as he should have been, though many times the accident has been less due to his fault than to the fault of the pedestrian."

It takes some courage to come out and make such statements in a public report when there is always a manifest antipathy toward motorists due to accidents.

The commission lost no time in appointing investigators once the power was conferred upon the board, and these men have different sections of the state to cover. When an accident occurs in a place and the commission hears of it, the investigator at once starts out to get the real facts. He is empowered by law to make arrests, if need be, and with the state back of him he can go more thoroughly to the bottom of the case than ordinary individuals. Also, he has the thought of what his work means to the state to spur him on, and so he generally gets at the truth. Where the conditions warrant it, he takes the matter to the proper authorities and seeks to bring about convictions in court. In this work the commission has been successful.

#### Motorists Not Always Blamed

It often happens, too, that the investigator finds that the motorist is not really at fault, although the newspaper reports at first may have made it appear so, so that the investigators very often find that they must absolve the motorist. The law works out very well in that respect. If the facts warrant a hearing by the highway commission, witnesses are summoned and they are put on oath and the facts established similar to that of a court room. The advantage of the law is that where a person has been convicted in the lower court of some offense and appeals, the commission by its investigators may get the real facts, and where the motorist is not at fault he may not be deprived of his license while the appeal is pending. And on the other hand, if it is a flagrant case and the man may have some influence or

pull to escape the court, the highway commission may get after him.

One such instance occurred a short time ago where a motorist driving through a small town one night near midnight hit a farmer's wagon and created havoc with horse and wagon, badly injuring the man. He began at once to try to square things up, and because he was a property owner in the town he had the chief of police squared, and was in a fair way to smother things, but for the highway commission investigator, who, on learning all the facts, had the man's license revoked and forced a prosecution.

When the commission has granted a hearing and a license is suspended or revoked, the motorist is notified immediately and copies of the notification are sent by the commission to the newspapers. Here is a sample of one day's hearings:

#### A Sample Report

Licenses suspended and revoked by the commission during the week ending February 3, 1912:

January 31—License of Harold R. Hutchinson, of Brookline, revoked, because it appeared after an investigation of an accident which occurred on January 8, 1912, resulting in the death of Mary Hayden, of Brookline, and in which a motor car operated by said Hutchinson was involved, and after a hearing that the commission was unable to find that the accident occurred without serious fault upon the part of said Hutchinson.

January 31—License of Martin J. Nee, of Boston, suspended, because it appeared from an attested abstract of a record of the municipal court of the city of Boston, holden at Boston, that on January 30, 1912, said Nee was found guilty of operating a motor car while under the influence of intoxicating liquor, and sentenced to 3 months in the house of correction, from which judgment he appealed.

February 1—License of Claude M. Patterson, of Brookline, suspended, because it appeared from an attested abstract of a record of the municipal court of the Roxbury district of the city of Boston, holden at Boston, that on January 31, 1912, said Patterson was found guilty of operating a motor car so that the lives and safety of the public were endangered, and was fined \$100, from which judgment he appealed.

The frequency with which these notices appear in the papers is warning enough for chauffeurs that they must be careful. Colonel Sohier, too, being a former member of the legislature, and a good speaker, manages to attend a number of motor events as the representative of the commission and he delivers addresses on careful driving. At the annual banquets of the Massachusetts Automobile Operators' Association he always is one of the speakers, and he has given the members a lot of good advice on driving cars and made it plain to them that they could aid in eliminating the reckless drivers by reporting instances.

#### Hopes Others Will Imitate

This year he has recommended to the legislature that the scope of the investigators be enlarged so that they may go into other states to secure evidence when Massachusetts drivers figure in accidents. Now they are kept within the confines of the Bay State. Colonel Sohier hopes to get the other New England states to adopt a similar law, so that they may all work in unison. Massachusetts and Connecticut work together on apprehending chauffeurs from either state that transgress the law beyond their own borders.



# New York's Standing in Motor Industry

WASHINGTON, D. C., April 20—Comparative summaries showing the standing of all the industries of New York in 1899, 1904 and 1909 have been issued by the census bureau at Washington. The relative standing of the industry during these 3 years is as follows, the figures showing the number of factories devoted to the manufacture of cars, bodies and parts: 1904, 35; 1909, 135. During this period the number of people engaged in the industry in the state was as follows: 1899, 344; 1904, 2,101; 1909, 11,610.

The report goes still further showing the amount of horsepower necessary in the operation of the factories, which was, in the different seasons, as follows: 1904, 1,254 horsepower; 1909, 9,398 horsepower.

The capital invested in these different factories during the years mentioned was: 1899, \$638,000; 1904, \$3,347,000; 1909, \$25,102,000.

In addition to the capital invested the report shows the wages or salaries and also material, which in 1909 were: 1909, wages, \$7,016,000; 1909, salaries, \$1,604,000; 1909, material, \$14,908,000.

A further department of the report shows the following interesting figures concerning the value of the motor product at these periods: 1899, \$456,000; 1904, \$4,626,000; 1909, \$30,980,000.

The report goes on further to show that the value added to the raw material by manufacturing processes amounted in 1909 to \$16,072,000. At this time the industry ranked in twenty-second place in the state. In 1904 it occupied sixty-ninth place.

## NEW DETROIT INDUSTRY

Detroit, Mich., April 22—The Michigan Electric Welding Co., which recently purchased the Detroit Electric Welding Co. and consolidated the two businesses, has moved the entire equipment into the plant formerly occupied by the Universal Radiator Co., recently purchased by the Michigan Electric Welding Co. The frontage of this property is 210 feet and runs back 120 feet to the Michigan Central Eastern Terminal Switch and the plant consists of one machine shop 50 by 84, an electric welding department 36 by 42, and the gas-welding department 28 by 50. New additional equipment has been installed, and with the increase of its business, the company is already planning to erect a new three-story re-inforced concrete building, consistent with the plants already erected in the Fairview district.

## TESTING TRACK FOR R. C. H.

Detroit, Mich., April 22—The R. C. H. Corporation is planning to construct a new testing track on its property adjoining the plant at the foot of Lyce street. It will be a 1¼-mile oval affair, built of 2-inch planking and banked to permit of speeding. It will be 20 feet

## Census Report Tells of Manufacturing Business in Empire State Since 1899

wide, with entrance and exit separate as a precaution against accidents. It will be supported on the outer edge by 6 by 6 posts, with the inner circle flush with the ground. Along the side will be a testing hill, with a gradient averaging 15 degrees. The cost will be in the neighborhood of \$10,000. Plans for the track are about completed and construction work is to begin this week. In addition to the other features mentioned, there will be a strip of sand and also a muddy stretch so that the cars can be subjected to every possible road condition met with by car users.

## VICTOR ELECTS OFFICERS

Buffalo, N. Y., April 24—At a special meeting of the Victor Motor Truck Co. Orson E. Yeager, president of the Buffalo Chamber of Commerce, was elected president of the truck concern. Additional directors elected at the meeting included H. B. Milward, Brooklyn, and Orson E. Yeager and John A. Murphy, vice-president, both of Buffalo, and both of whom have recently become stockholders of the Victor company. Victor's specialty is motor fire apparatus.

## HENRY PLANT SOLD

Grand Rapids, Mich., April 22—The Henry Motor Car Co., of Muskegon, which has been in financial difficulties for some time, has been sold to G. Sachsemaier and E. Levene, of Philadelphia, in the United States court here for \$9,000. The sale has been confirmed by Judge Sessions. The principal stockholders were C. A. Latimer and E. Demageo, of Bloomington, Ill.

According to Trustee John H. Moore, the manufacture of Henry cars, of which about 600 were built, will be discontinued. Repair parts as well as the good will and repair business have been purchased by the Muskegon Auto Co. A. R. Palmer, formerly with the Henry company, is connected with the Muskegon Auto Co. and will look after the interests of Henry owners.

## CONTROLS EVELAND SELF-STARTER

Niagara Falls, N. Y., April 24—The United States Light and Heating Co. of this city has secured control of the F. F. Eveland Co. of Philadelphia, manufacturer of the Eveland electric self-starter and lighting device for motor cars, which

plant is to be established here in connection with the local concern. The acquisition of this firm means the employment in this city of 400 additional men in the company's plant.

## TO BUILD BODIES IN DETROIT

Detroit, Mich., April 20—The England Mfg. Co. has been organized here to manufacture bodies of pressed steel. It has an authorized capital stock of \$50,000, all of which has been subscribed and \$6,000 paid in cash. The principal stockholders are Fred England, John W. Foster and J. Albert Davis, all former residents of Amesbury, Mass.

## CROXTON WILL MOVE

Washington, Pa., April 20—J. P. Stoltz, president of the Croxton Motor Co., and the local board of trade has entered into a contract whereby the Croxton company will remove its factory from Cleveland, O., to this city. Contracts for a new plant, 600 by 120 feet, will be let and the factory will be located on the B. & O. The company will build taxicabs and employ 200 men.

## ENGINEERS APPOINT COMMITTEES

New York, April 22—The summer meeting of the Society of Automobile Engineers will be held June 27-29 at Detroit, with headquarters at the Hotel Pontchartrain. The following committee assignments have been announced: Entertainment, H. E. Coffin, chairman; finance, H. M. Leland, chairman; transportation, F. H. Floyd, chairman; hotels, G. W. Dunham, chairman.

## BUYS MORE FREIGHT CARS

Chicago, April 23—The Missouri Pacific Railway Co. is having built 900 stock, 500 motor car and 500 furniture freight cars. The dimensions of the motor car and furniture cars are 40 feet long, 10 feet high, with 10-foot wide staggered doors. The motor car cars have large end doors and are of the same size as the furniture cars.

## SUNDRY MAKERS HELP A. A. A.

New York, April 23—Checks aggregating \$5,000 contributed by the Motor and Accessory Manufacturers to aid in the activities of the American Automobile Association have been sent out. The amount is divided into two funds; one of \$2,500 for the furtherance of good roads work and the other \$2,500 for general expenses of the organization.

## DORMAN LOCATES

Peekskill, N. Y., April 22—Frank D. Dorman, formerly secretary of the United States Motor Co., has accepted the presidency of the recently organized Steibock Engineering Co., in which H. E. Steinbock is designer. The company will put out a medium-priced car.



## Prevents Back Kick Mechanism Suggested to Avoid Injury in Cranking—Ignition Too Far Advanced

GARNER, Ia.—Editor Motor Age—I have a Ford roadster, I do not know what model but it is an old one, with planetary transmission with two speeds, and the flywheel and fan in one. Occasionally I am troubled with back-firing, and I thought that if the flywheel had cogs like a bevel gear I might get another pinion and attach it as per Fig. 1.

2—I have a Maximus carbureter on this Ford roadster, and it allows the gas to escape. I think this occurs at the pin that shuts off the gas. I am of the opinion that the pin does not seat, or that the cork is too heavy and does not float. What can I do to remedy the trouble?

3—Where can I get plate glass 42 by 12 inches or 44 by 14 inches? I want this glass to put in a frame for a windshield.

4—Which is the best non-skid tread for tires?

5—Where can I secure burners for E & J combination oil side lamps? I would like to put in gas burners. I have a generator for two lights.—Karl Kraus.

1—Since you state in question No. 2 that the carbureter allows gas to escape and that it is worn around the pin on which the throttle is pivoted, it is reasonable to believe that your back-firing is due to an excess of air in the fuel mixture.

As for the tendency to kick back when cranking, or start in the opposite direction to that in which it is intended to run, this most probably is due to ill-timed ignition, which may be due to lost motion in the spark-control mechanisms.

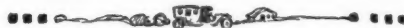
Your suggestion regarding the cutting of teeth in the flywheel is not a good one for you would throw the motor out of balance, but a small bevel gear attached to the side of the flywheel might work nicely. Otherwise the suggestions, however, are very good and illustrated in Figs. 1 and 5, for the benefit of other readers. All that is necessary to eliminate the back-firing in your motor, or its tendency to kick back when cranking, is to have your ignition properly timed.

To inspect the timing of your motor examine the commutator to see that it is not worn out or too wobbly on the shaft. To disconnect the commutator, remove the brass cap with a short screw driver; unscrew the lock nut; withdraw the steel brush cap; drive out the retaining pin, which will allow removal of the commutator from the camshaft. In case the fibre, contact points, or segments and roller are badly worn, the most satisfactory remedy is to replace them. The spring should be strong enough to make a firm contact between the roller and the segments. In replacing the commutator, crank the engine over until No. 2 inlet valve opens wide; then turn the crank just enough to bring the valve two-thirds of the way on the



# The Readers'

Reader Submits Illustrations of Inventions for Starting Motor Safely—How to Time Ford Ignition—Owner Carrying Dealer's Number May Be Responsible for Accident



## Class Racing Records Marmon Holds Road and Speed- way Marks in 231-300 Inch Division

CHICAGO—Editor Motor Age—I would like to know which car holds the road record in the 300 and under class, and also the speedway record up to 100 miles in this class.—J. P. Knott.

Motor Age presumes you refer to the 231-300 cubic inch class, for the American Automobile Association does not classify under the caption "300 cubic inches and under."

The best road record in the 231-300 class was made in 1911 and stands to the credit of the Marmon driven by Bruce Keene, which averaged 68.78 miles per hour, in the Santa Monica road race. Hughes in a Mercer averaged 68.34 miles per hour at Savannah, and in the same car did 64.61 in the Kane County cup race at Elgin. In the Fairmount park road race at Philadelphia, in the 231-300 class, Hughes in a Mercer did 57.91 miles per hour, while in the 231-300 class in the Panama road race Bigelow in a Mercer averaged 57.32 miles per hour.

The 231-300 class speedway record for 100 miles stands at 1:25:22.07 made by Harroun in a Marmon on the 1-mile board speedway at Los Angeles, April 8, 1910. This is a class C speedway record.

## OWNER RESPONSIBLE

Watertown, S. D.—Editor Motor Age—1—If a man driving his own car having his own license, but having a dealer's number, has an accident and some one of the opposing party get hurt, who would be held responsible for same, the dealer or the owner of the car?

2—How many different makes of spark plugs are on the market today?

3—How many manufacturers are putting self-starters on their 1912 models at the present time?—A Reader.

1—The owner of the car would be held responsible, a prominent Chicago lawyer contends. This same authority also points out the fact that the owner was carrying a number other than his own, which is against the law, might damage his case in court.

2—The Automobile Trade Directory reports 101 American concerns making spark plugs.

3—Probably about seventy-five.

down stroke; and set the commutator so that the lead-rod connection is in a vertical position as shown in Fig. 2, when the roller will be on contact to fire No. 1 cylinder at the proper time.

2—It would be most practical, perhaps, to have a new carbureter fitted to your motor. If, however, you should deem this too expensive have the carbureter overhauled. A new pin should be fitted to the butterfly valve and the bearings rebushed so that no air will be admitted at these points; then see that all joints between

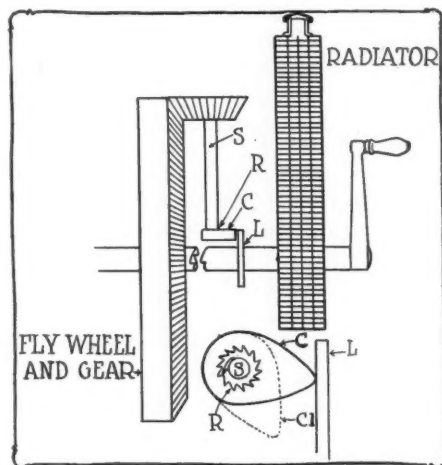


FIG. 1—KRAUS SAFE-CRANKING DEVICE

A ratchet R on end of shaft S operates cam C against collar L in case of back kick. C1 is normal position of cam

the carbureter and the cylinders are perfectly tight. Thoroughly shellaced paper or asbestos gaskets are used at these points to good advantage. As for the float, remove it from the carbureter, place it in an oven or some other warm dry place for a few hours to dry it thoroughly, then reshellac it thoroughly and allow it to stand for at least 36 hours so that the shellac will set hard.

3—The plate glass desired may be obtained in almost any size ordered from the Pittsburgh Plate Glass Co., Davenport, Ia., or from any other plate glass company, perhaps, having an agency or branch supply house in your vicinity.

4—Motor Age does not pass judgment upon such points.

5—Burners for E & J combination oil side lamps may be obtained from the Edmund & Jones lamp factory, Detroit, Mich. Any nearby motor car supply house might be able to furnish combination burners.



# Clearing House



Paul Sargeant of Department of Agriculture on Highway Construction—Carpenter Submits Theory on Misfiring—Special Switch Required for Double Ignition System

## Double Ignition Switch New Orleans Motorist Advised As to Making Desired Changes

NEW ORLEANS, La.—Editor Motor Age—I have on my car a four-unit Heinze spark coil back connected to timer and plugs, and three-point plain switch mounted on coil box, the switch having three positions, i.e., magneto, off, and battery, used in connection with a Bosch magneto, a 6-volt storage battery, and two sets of spark plugs. Kindly illustrate wiring of switch, a diagram of switch is shown in sketch, and advise, with illustration, as to changing switch and wiring of same in order to have four positions, i.e., magneto, magneto and battery, off, and battery.—Lawrence.

Motor Age knows of no way by means of which you could use the switch now employed on your car for the double ignition system as above described, and would suggest that as the change will require re-wiring of the coil box, and the fitting of a switch of special construction, it would be advisable to send your coil to the Heinze Electric Co., Lowell, Mass., where every facility of doing such work is provided.

### WHEN THE MOTOR MISSES

Sauk Center, Minn.—Editor Motor Age—There is nothing more exasperating and sometimes very puzzling to find when you start your motor that it misses at low speed, or when you first start out, just before the motor gets warmed up to business. Many a man has spent valuable time in trying to unravel the mystery. I have myself perplexed myself time and again over the matter and tried times without number, almost, to find the real cause of this miss. I often have read in Motor Age questions along this line and have been prompted to give my final solution of the matter in the interests of drivers who have not been able to solve the mystery. I tried adjusting the tremblers, air valve, throttle, wires, and in fact everything that had anything to do with the ignition system of the car but to no purpose. That miss would bob up like Banquo's ghost almost every time the motor was started, but after a few jerks and staggers it would run like a top.

This is the way I found the difficulty: I opened the throttle five notches, retarded the spark, and the shaking was still in

evidence as usual. I then gradually retarded the throttle and advanced the spark a notch at a time and with the cut-out open so as to hear more plainly, I found improvement in less vibration, and by still advancing the spark lever the motor began to roar and the missing soon was entirely gone. I then again went over my back tracks and was rewarded by a complete understanding of that mysterious missing. Now the reason is this: The pistons firing the heavy charge after dead center was reached caused the missing and vibration, as the mixture was entirely too

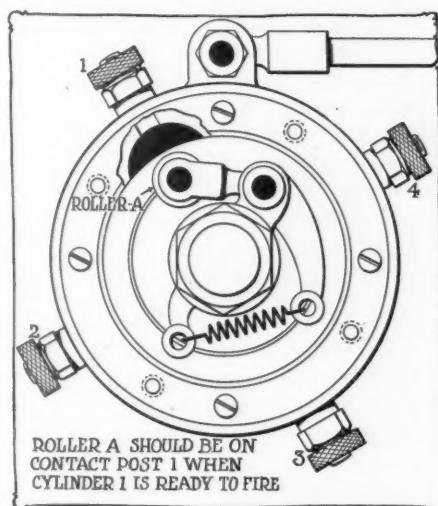


FIG. 2—FORD COMMUTATOR

*In case the fiber, contact points, or segments and roller A are badly worn, the most satisfactory remedy is to replace them*

rich for the spark and sometimes it would fire and again it would not, thereby causing the excessive vibration set up. As soon, however, as the proper mixture was fired by the advanced spark, the piston not reaching the dead center until the gas was ignited, the proper spread, so to speak, of the flame arising from the burning mixture was given more time to make its power, which was completed just after dead center was passed.

This action of the advanced spark more fully balanced the four cylinders, and compression taking place with increasing vigor as the pistons were reaching dead center, gave the spark more time to do its work more thoroughly, thereby eliminating the missing of first one and then another cylinder, and at the same time producing more power with a vast amount less of vibration.—A. D. Carpenter.

## Road Making Hints United States Government Official Gives Information on Avoid- able Difficulties

MITCHELL, S. D.—Editor Motor Age—A recent editorial in Motor Age has interested many South Dakotans in the subject of road construction, and we would like to have some information on it. Our country is level, so to speak, and prairie with but very little ever having been done in road making, there being mostly sod where the ditches come. Does Motor Age think it would pay to break the ditches out 1 year in advance in order to have mellow dirt instead of raw sod with which to construct.

2—What width would Motor Age suggest for the road from outside to outside of ditches?

3—How much crown should the grade have, and would it be necessary to employ an engineer to stake out grade.

4—Could a practical man with one good eye measure so many feet from the center of the road and stick stakes to work, using the wages he would get to pay for the handling of the dirt?—D. B. Miller.

1—According to information received from Paul Sargeant of the United States department of agriculture, department of public roads, the "sod should be removed from the entire roadbed and not imbedded with the soil. It does not decay for years but lies, generally in bunches, forming a cushion over which it is practically impossible to compact the soil. Such a bunch of sod is not infrequently the cause of a chuckhole, for, aside from refusing to compact, it holds moisture. To avoid these difficulties, the sod should be removed.

2—"The road should be from 22 to 25 feet wide between the ditches. The width of the ditch will vary with the grade of the road, the nature of the soil, and the amount of water to be accommodated. A broad, shallow ditch will cause the water to run more slowly than a deep, narrow ditch on the same grade; consequently there will be less wash in a shallow ditch. As the grade of the road increases or the soil becomes lighter, the ditch should be widened. Similarly, a ditch which must carry the water accumulating over 800 feet or 1,000 feet of road necessarily must be wider than one which carries water to an outlet in a distance of 200 feet or 300 feet."

3—"The crown of the roadway will vary with soil conditions and the grade of the road. Where the road is built on a soil which readily absorbs water and becomes soft when wet, the crown should be increased to hasten the flow of the water to the ditches. As the grade increases and the water tends to flow along the road and form ruts, the crown should be increased. The crown generally is made to vary from  $\frac{3}{8}$ -inch to 1 inch per foot over the roadway. Under extreme conditions of soil and grade, the shoulders along the ditches are

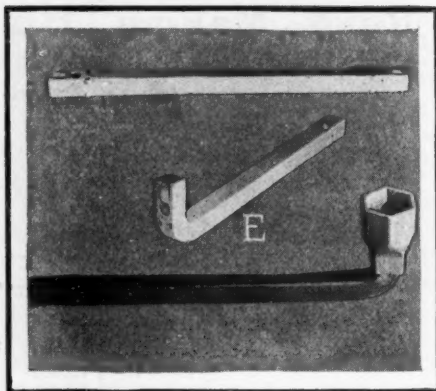


FIG. 3—CARROLL AUTO-CLE EXTENSION

sometimes given a slope of  $1\frac{1}{4}$ -inch per foot."

4—"It is not absolutely necessary to employ an engineer to stake out the work; but when a proper survey has been made and the plans based on the survey are indicated by stakes, the man who executes the plans has definite information to work to. Grade stakes set by eye are responsible for much of the poor drainage that undermines roads, for the eye is not a safe guide in determining slopes and differences in elevation. Intelligent engineering and intelligent superintendence are both essential to the road builder.

#### USEFULNESS OF THE AUTO-CLE

Saint Ansgar, Ia.—Editor Motor Age—Readers of Motor Age possessing an Auto-cle wrench, can increase the usefulness of their sets from 50 to 100 per cent according to the amount of use they have for it. A repairman wishing to remove a pair of cylinders from a small engine must have a special wrench and remove the two intake valves to be able to get at the bolt or cap screw between the cylinders, unless he possesses the following tool.

It could be made from any suitable piece of metal, but I procured an extra long-extension E, Fig. 3, bent it hot in a vise, leaving the part over which the socket fits, its original length and in the same condition, with the exception of the spring whose temper was drawn. This was replaced by the spring from the opposite end, and I have a tool which is used nearly or quite as often as the original wrench. Even this spring may be saved however by removing it before heating the extension, and afterward replacing it.

One of the chief advantages of this tool lies in its ability to be used where less than one-sixth turn can be given a wrench.

By removing the socket and giving it a one-quarter turn on the extension after each application, twelve applications are necessary to give a nut one complete turn, each movement being through a thirty degree angle. This has proven ample for all purposes. The handle being square, takes up less room than a 15 degree angle wrench, and sockets can be used where the jaws of any other type wrench would not enter.—Guy B. Carroll.

## Benzene, Benzine, Gasoline, Naphtha

### Difference in Fuel Explained—Gear-Ratio and Wheel-Sizes

#### —Reader Submits Useful Auto-Cle Suggestion

BUTTE, Mont.—Editor Motor Age—With about what grade of gasoline does benzine compare?

2—I have noticed a certain motor magazine claims that on account of water-cooled engines being kept too cold they seldom win full efficiency tests. Does Motor Age know of an air-cooled engine ever winning one?

3—Where ether is mixed with gasoline for racing purposes, what per cent of ether is used, or how much more powerful is ether than the best grade of gasoline?

4—What is the difference between the speed and pulling power of a car equipped with a 40-inch wheel and 4 to 1 gear, and a car with a 34-inch wheel and  $3\frac{1}{2}$  to 1 gear, both using the same size engine?

5—What is the advantage in using an egg-shaped piston head over a flat piston head. Having the same cylinder bore is there more area in the oval piston head? —J. H. Shaughnessy.

1—Benzine, is rather an undesirable name because of its similarity to that of benzene. Benzine is a commercial name for naphtha, a mixture of the lighter volatile hydrocarbons that pass off in the earlier stages of the distillation of crude petroleum. Whilst benzene is an aromatic hydrocarbon obtained through the distillation of coal tar. Coal tar is a black, opaque liquid obtained by condensation from the products of the distillation of coal. Benzene therefore is obtained from crude petroleum; whilst benzene is a coal tar product.

If you were to go to the Standard Oil Co. or any of the petroleum oil companies or dealers and ask for some benzine you would get a grade of naphtha having a density of about 55 or 56 degrees on the Beaume scale. The grade of the naphtha they would give you, might vary according to the purpose for which you intended to use it. The naphtha generally used by cleaning establishments and sold to the layman by druggists under the name of benzine would test about 55 or 56; whilst the varnish maker and the painter might use a grade testing as low as 40. If you were to ask for gasoline such as is used in the motor car you would get a grade of naphtha of about 60 or 62 degrees on the Beaume scale.

You will see from this that both gasoline and benzine, as now sold to the public is known to the manufacturer or dealer as naphtha. In the manufacturing laboratory, specifically all gasoline and benzine is naphtha. Naphtha is one of the first distillants of crude petroleum. Crude petroleum, rock oil, mineral oil, or natural oil as it is sometimes called, is a dark brown, or greenish inflammable liquid, which at certain points exists in the upper strata of the earth, from which it is pumped, or forced by pressure of the gas attending it. It consists of a complex mixture of various hydrocarbons, is refined by distillation, and the chief products include gasoline, naphtha, benzene, kerosene, lubricating oil and paraffine.

2—In July of 1909 the Automobile Club

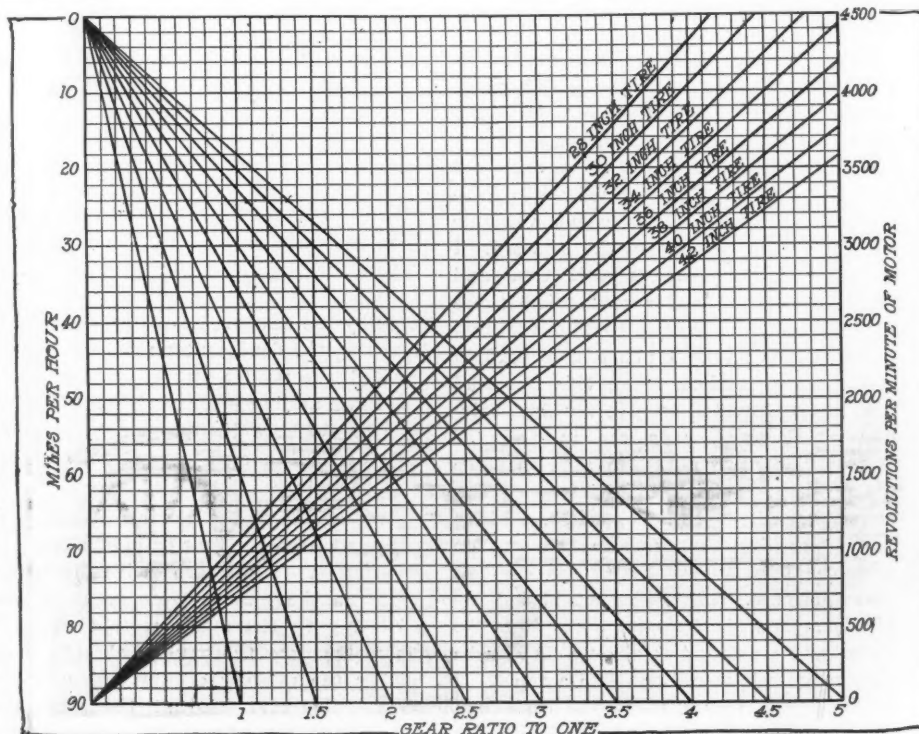


FIG. 4—CHART SHOWING RELATION OF GEAR-RATIO AND WHEEL SIZES



# Fuel Efficiency of Air-Coolers

## Inquiry as to Performances of the Type Answered—Egg-Shaped Piston-Head Poor Design—Mysterious Miss

of Buffalo promoted a 1-gallon mileage test for motor cars run on a ton-mile basis. Twenty cars competed. The cars were weighed with the passengers aboard, after which 1 gallon of gasoline was poured into the tank of each car. A Franklin air-cooled car made the greatest mileage on its gallon, going 46.1 miles. This car weighed 2948 pounds and was a 1910 model. At the finish of the test the car had 135,902 points and the best that any one of its eighteen competitors which finished could score was 86,612. The average of these eighteen contestants was 64,495 points, or 71,407 fewer than the Franklin figure which more than doubled it. The Franklin's total mileage of 46.1 exceeded by 20.4 miles, or 79 per cent, the average of 25.7 miles that the other eighteen scored. The Franklin's car and passenger weight of 2948 pounds, exceeded by 161 pounds the average weight of its competitors which was 2787 pounds. The weight for all entries was 55,904 pounds; a total mileage of the nineteen which finished was 509.1.

The Franklin was an 18-horsepower touring car which went through the competition without road stops or trouble. The course was slightly rolling with grades of about 1 per cent, and on the outward trip there was a slight head wind. The roadway was first one of good asphalt, then in succession brick of indifferent quality, badly worn macadam, a stretch of good macadam followed by one of bad macadam full of holes and crossed

by high cross walks, and finally a fair piece of state road. In addition to capturing the general contest trophy in this event the Franklin won the trophy for its class, which was for motor cars ranging in value from \$1001 to \$2000.

It was with a car of the same type and power, but of 1909 model, that a previous record was made in the spring contest held on Long Island roads by the New York Automobile Dealers' Association. In this event the air cooled Franklin defeated nineteen rivals and carried 2880 pounds 35.8 miles, this being a ton mileage of 51.5. Up to this time the Franklin had held for 3 years the 2-gallon world's record for gasoline economy, which was made May 15, 1906, in a contest held by the Automobile Club of America upon a Long Island course. The car which established the 2-gallon record was one of 12 horsepower and it carried a weight of 1500 pounds 87 miles. Only seven of its opponents were able to go as far as 50 miles. To show that there was no luck about the result the car was sent over the route on the following day and then made 95 miles on its allotted 2 gallons.

3—Ether is claimed to give more powerful explosions in the cylinders of a motor, when used in proportions of 3 ounces of ether to 5 gallons of gasoline. Motor Age has no data, however, relative to official tests of the horsepower gained.

4—Assuming that motors of the same horsepower are employed in both instances, the speed and pulling power of

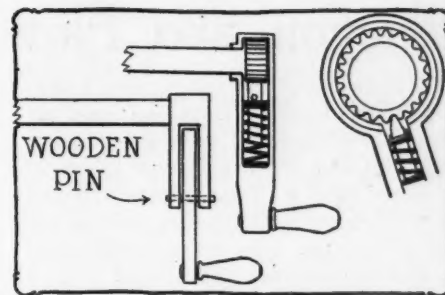


FIG. 5—MORE KRAUS SAFETY CRANKS  
Amateur inventor submits two types of motor crank designs that would reduce danger of broken arms in case of a back-kick

the car with the 40-inch wheels and the 4 to 1 gear ratio would be greater at high speeds; but at lower speeds the car with the smaller wheels and gear ratio would have the greater pulling power. This is because the motor of the car with a  $3\frac{1}{2}$  to 1 gear ratio and 34-inch wheels would have to turn faster than the one with the 40-inch wheels and 4 to 1 ratio. The chart Fig. 4, will give a fair idea of the relation of these factors.

5—There is more area to the egg-shaped piston head and for this reason is a poor design because there is a greater area subjected to the heat of the gases, and cooling efficiency is reduced. Besides if the egg-shaped piston is depressed or concaved the iron of the head would be subject to a tensile strain which is bad for cast iron.

### CAUSE OF MYSTERIOUS MISS

Vicksburg, Miss.—Editor Motor Age—Noting query in Motor Age, issue April 11, page 27, entitled "A Mysterious Miss," and its answer, I would offer the following solution of the trouble, which I have noted on several similar occasions, but not on the E-M-F, although it would be the same. Mr. Downing having ground the valves, undoubtedly removed the manifold, and in putting back the intake he did not get an air-tight joint where the manifold joins cylinders three and four. It might be the gasket leaks or is not drawn tight enough. If Mr. Downing will fit new gaskets, or shellac both sides of the old one and draw it down tight and even, the trouble will be remedied.—G. L. Larr.

### BOYS RESURRECT OLD CAR

Canyon, Texas—Editor Motor Age—In Fig. 6 is shown one of the first models of the Oldsmobile runabout. Two boys, aged 10 and 14 years, bought this car in New Mexico, paying \$5 for it. Resurrecting it from the junk pile they added batteries, a buggy dash and many other pieces not made in a factory and succeeded in making it run. They passed through this city on their route to Oklahoma, having driven over 200 miles. They believe the car capable of many hundred miles more.—E. Burroughs.

There is reason to believe that there are a great many such cars of even later vintage, stored about the basement of motorists and dealers that are serviceable.



FIG. 6—OLD OLDSMOBILE RESURRECTED BY OKLAHOMA BOYS

# Induction and Flow of the Magneto Currents Described

HOWE, Ind.—Editor Motor Age—In the Readers' Clearing House columns, in answer to the following question—"From which point of a spark plug does the current jump with a Bosch magneto?"—I noticed the reply, a statement which surprised me greatly. I have been associated with gasoline engines for several years and always have taken it for granted that the current always jumps from the positive pole of the spark plug. The cause of the jump of the spark is the potential difference between the two poles and I cannot see how it would be possible for the spark to jump from the negative pole as was stated in answer to the question. I would be pleased to hear from Motor Age in regard to this question.—S. K. P.

The answer to your question as published in Motor Age, March 14 issue, page 23, was as follows: "The current does not jump in the same direction always, but probably oscillates back and forth, changing with the alternations of the primary current." There is nothing in this statement to the effect that the spark at the poles of the spark plug jumps from the negative pole, as you claim. You are quite right in assuming that the current always jumps from the positive pole or electrode of the spark plug; but just which of the two electrodes or sparking points of the plug is positive and which negative, depends entirely upon the direction of the current in the secondary winding at the time that the spark occurs.

It was explained in a recent communication from an expert on magneto construction that the opening of the low-resistance path across the circuit-breaker allows a sudden rush of current to the condenser and primary winding of the coil, which begins to oscillate and continues to oscillate until the vibrations die out from the effects of the damping. The

## Effort is Made to Simplify a Complicated Subject—Discussion of the Problem

passage of the oscillatory current through the coils of the primary winding of the coil naturally produces rapid reversals of the magnetic lines in the iron wire core, which by induction create a rapidly alternating difference of potential between the ends of the secondary winding to which the spark plug is attached. If this takes place in the secondary circuit of the Bosch magneto, the electrodes of the plugs change rapidly from positive to negative, according to the alternating difference of potential between them, and the sparks jump back and forth accordingly.

If, however, there are no such oscillations of the secondary, and but one spark jumps across the points of the plug for each explosion, then in a four-cylinder motor the spark will always jump from the same electrode, either the insulated or ground electrode as the case may be.

An effort has been made in the accompanying illustrations, to show the principle of magnetic induction, the relations between the magnets, the armature and primary winding of the magneto, and the direction of flow of induced primary current. If a copper wire which is a good conductor of electricity, is wound around a core or soft iron bar C or a bundle of soft iron wires, as indicated in the two illustrations X and Y, Fig. 7, there has been formed what a technical electrician would call a helix, or coil. Now if the two ends O and I of the upper coil X were connected to a battery, the end I to the positive terminal and the end O to

the negative terminal, the current would enter the coil at I and leave at O and the current would travel around the core C as indicated by the arrows. The core then would become magnetized, and the right end would be the south pole S and the left end the north pole, N. That is, there would be a magnetic force in the core, and if the core were balanced and suspended from a thread, the left end would swing around and finally come to rest pointing toward the north, and the opposite end pointing toward the south.

There is a method known as, the right hand rule, for determining the polarity of a magneto from the direction in which the current flows around it. This rule is as follows: If a coil is grasped in the right hand in such a way that the fingers point in the direction in which the current is flowing in the wires, the thumb will point in the direction of the north pole of the helix.

In the upper illustration, the current enters the wire at I, flows around the coil in the direction in which the fingers are pointing, consequently the north pole is at the left. In the lower illustration, Y, the direction of the current through the coil has been changed by reversing the connections to the battery; so, in order that the fingers might point in the direction of the current flow, it was necessary to change the grip; thus the thumb pointed in the opposite direction, indicating that the right end of the core is now the north pole, and the left end the south.

In the same way, if the sign of the poles is known, but the direction of the current unknown, the direction of the current may be determined as follows: If the right hand is placed against the coil with the thumb pointing in the direction of the lines of force, toward the north pole

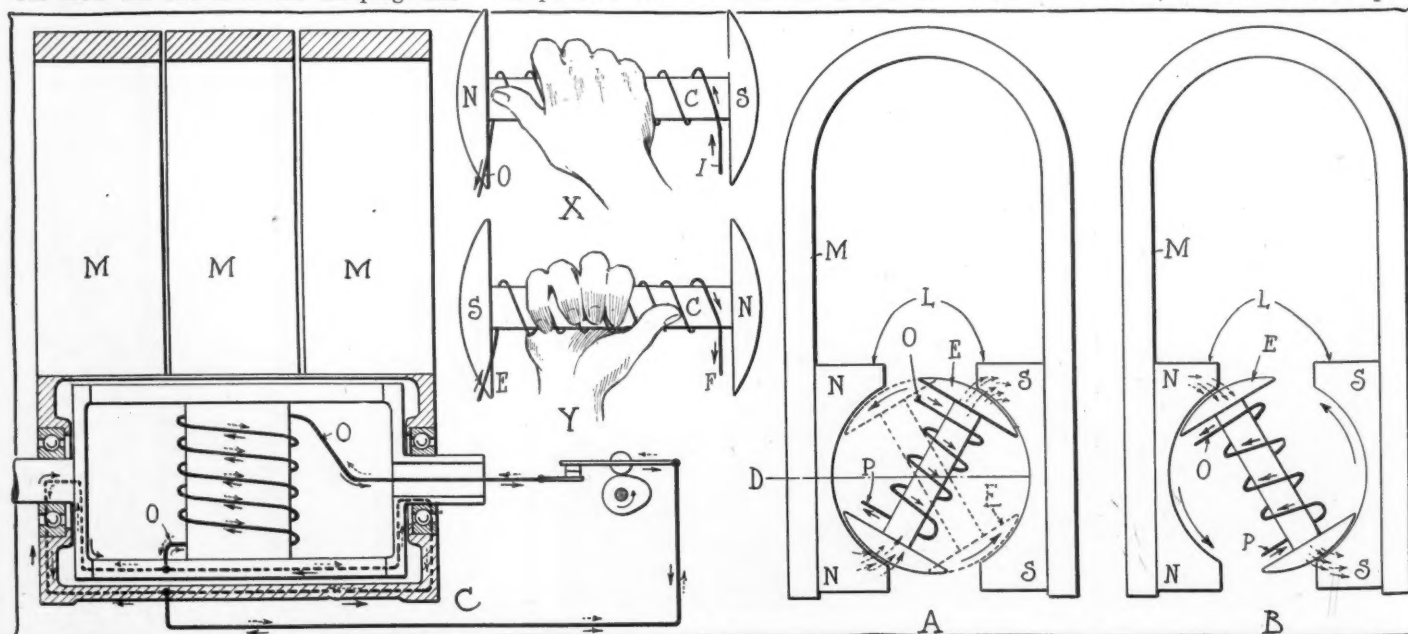


FIG. 7—DIAGRAMATIC SIDE AND END SECTIONS OF MAGNETO, AND APPLICATION OF RULE OF THUMB POLARITY INDICATOR



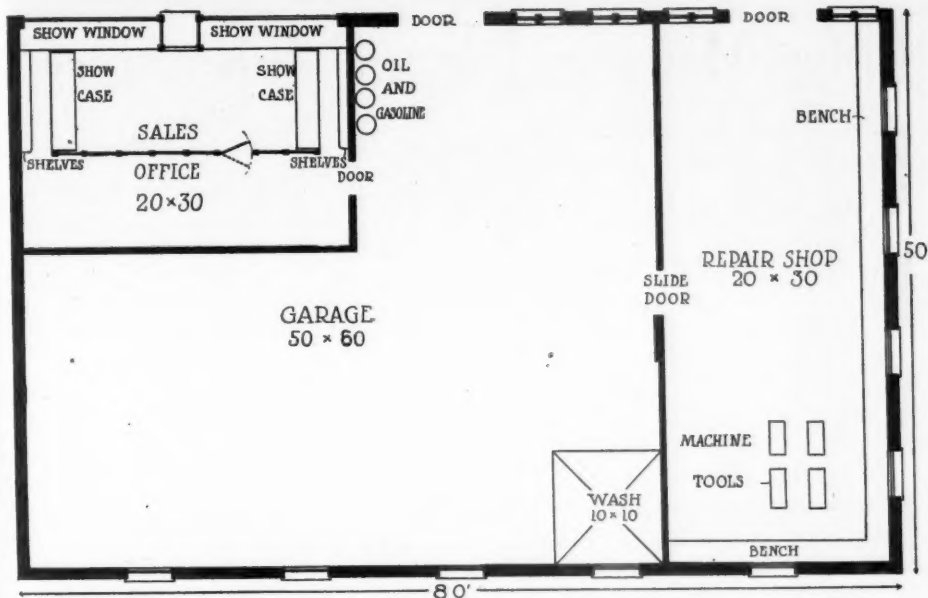


FIG. 8—PLAN OF GARAGE SHOWING LOCATION OF DEPARTMENTS AND FIXTURES

of the coil, the fingers will pass around the coil in the direction in which the current is flowing.

In Fig. 7 side and end section views of a magneto are graphically shown with the generation and direction of flow of the primary current indicated by arrows. In a magneto, the magnets M are secured to iron pole pieces L, between which the armature of the machine revolves. The armature is a coil or helix comprising a core around which is wound the wire as indicated. This core also has curved shoes at its ends which might be termed pole shoes, these revolve so that their outer curved surfaces pass very close to the pole pieces L.

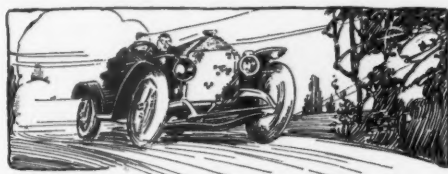
As indicated by arrows, the armatures of these illustrations revolve in an anti-clockwise direction so that when in the position indicated at A, the magnetism or magnetic flux is passing from the lower end of the north pole N diagonally upward through the core of the coil to the upper end of the south pole. The direction of the magnetic flux between the ends of a horse-shoe magnet always is from the north to the south pole, thus it has been passing in the direction indicated by the arrows since the core left the position indicated by the dotted outline. The magnetic flux begins to pass through the core as indicated at A when the core gets into the position of the dotted outline. As it moves into the horizontal position represented by the dot and dash line D, the magnetic force increases in strength; and then the force decreases until the position indicated at A is reached. This moving of the armature in the highly magnetized atmosphere existing between the pole pieces of the magnets, creates an electrical impulse to throb through the wire coil wrapped around the core of the armature; and if the two ends of the wire coil were connected a current would flow through the wires in the direction of the little arrows, coming in at O

and flowing out, say, at P in the illustration. As shown at B, the armature has moved around into a position indicated by the dotted outline of A. Now the end E is opposite the north pole N, and the flux or magnetic force in the armature core is in the opposite direction; thus the throb or pressure in the wire winding around the armature core is in an opposite direction, the positive current coming from the end O and the negative current going in at P. The pressure of the current or impulse in the wire winding is technically known as the electro-motive force, designated E. M. F., and its strength is spoken of as voltage. As the direction of the current in this winding, which is known as a primary winding, is changed alternately every half revolution of the armature, the current is known as an alternating current.

In the side-sectional view C, Fig. 7, the alternations of the primary current through the entire circuit are indicated. When, as indicated in the end section A, the positive current leaves at the end P of the winding, it flows out through the ground connection of the armature as indicated by the dotted arrows through the circuit-breaker points, and back through the insulated electrode to the other end of the winding to complete the circuit. In the same way, when the magnetic flux is reversed through the armature as indicated at B, the primary current takes the circuit of the heavy arrows.

#### PLAN FOR GARAGE

St. Petersburg, Fla.—Editor Motor Age—We expect to erect a garage in the near future and would greatly appreciate any suggestions Motor Age might offer for the



arrangement of the interior. The building is to be 50 by 80 feet. The 80-foot side faces the street, with one door at each end facing the street. We expect to store, repair, and wash cars and carry a few accessories; also oils and gasoline.—St. Petersburg Hardware Co.

In Fig. 8 is illustrated a plan of a garage of the dimensions and layout you desire with the location of the various departments and some of the tools and fixtures indicated. So far as the location of the equipment is concerned a good deal of freedom can be allowed in a garage of this size, and your special requirements may make it advisable to materially change this. Your architect can best inform you on this point. It may be that neighboring buildings, or other conditions, will necessitate changes in size and location of the windows, the suggestions in the plan being merely for the purpose of giving you a working basis.

The salesroom and office may be combined, as shown in the illustration, and separated by a railing with a gate. Or these two departments may be different rooms. A plan often followed in city garages, where the tanks for gasoline and lubricating oil are placed near the door, is to have them just outside the office wall with a window from the office overlooking them. In this way the sale of these supplies may be checked from the office.

An objection to the arrangement as outlined in Fig. 8 is that the office is not in sufficiently close touch with the repairshop. If this is considered serious it may be well to locate the salesroom and office next to the repairshop wall, with a door communicating with the shop. This arrangement will give office supervision over all departments.

#### HAS HAD SIMILAR EXPERIENCE

Sault Ste Marie—Editor Motor Age—In Motor Age, issue April 11, page 28, Subscriber in Creston, Ia., asks for a remedy for a leak in his car. I have had a similar experience and found that it came from the pins holding the rings in position on the piston, or a sand hole that breaks through the piston under the rings. I have found this to be the case on several motors.—H. N. French.

#### MEANING OF CAR NAMES

Indianapolis, Ind.—Editor Motor Age—In regard to the letters F-I-A-T, or Fiat, what do the letters stand for?

2—The letters K-R-I-T, what is their meaning?

3—Also the letters F-A-L, or Fal?—L. N. Hodge.

1—The word Fiat is a combination of the initial letters of name of the manufacturer of this car, Fabbria Italiana di Automobili Torino.

2—The name K-R-I-T is contraction of the name of the designer of the car, Crittenden.

3—The letters F A L stand for the initials of the founders of the company, Fauntleroy, Averill and Lowe.

# Swiss Puts Out Car With Novel Features

## Martin Fischer Designs Non-Poppet Valve Motor Which Differs Much from the Conventional

ALTHOUGH only a small country there are some important motor factories in Switzerland, among the principal of which are the Piccard-Pictet, Martini, Stella, Berna and Saurer, the last two being more intimately connected with the production of industrial vehicles. To the list of manufacturers has now to be added the name of Weidmann & Co., of the Brunau Automobilfabrik, Zurich, who have produced a car known as the Fischer, this being the name of its designer. The Fischer car simply bristles with features which, while being radical departures from existing practice, are not by any means described as freaks, by European critics, especially as the makers have submitted them to the most exhaustive tests during the past 2 years over the hilly roads of the Alps, which are within measurable distance of the firm's works.

The motor is a four-cylinder, of 3 3/8-inch bore by 4 1/2-inch stroke and rated at 16-22 horsepower. It is an entirely new design of non-poppet-valve engine. The illustration, Fig. 1, gives an idea of the method adopted to open and close the inlet and exhaust ports. It is difficult to give a type name to the Fischer motor, but, doubtless, it is somewhat akin to an engine with piston valves. From Fig. 1 it will be noticed that in place of the double reciprocating sleeves as used in the Knight and the single sleeve with its peculiar elliptical motion of the Argyll, in the

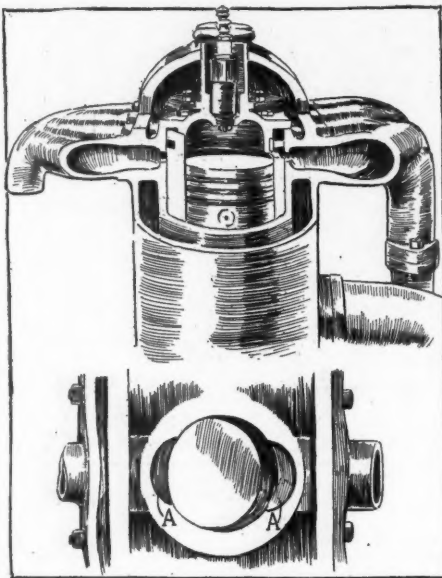


FIG. 1—SECTIONAL ELEVATION AND PLAN THROUGH HEAD OF FISCHER ENGINE

Fischer the ports are opened and closed by means of two crescent-shaped—in section—members A which rise and fall in recesses formed in the cylinder wall, suitable ports being of course cut in the segments to afford the necessary communication between the inlet and exhaust manifolds and the interior of the explosion chamber at the proper moment in the cycle of operations.

Ample provision is made to prevent any loss of compression, while the makers declare that on the explosion stroke the reciprocating motion of the segments is for the time being suspended, the result being that very rapid opening and closing of the inlet and exhaust ports, with an intervening long period of open-port position, is secured. Other advantages claimed for the

## Change-Speed Gear Also Is Something Out of the Ordinary—Chief Features of New Model

arrangement are the absence of any difficulty in connection with the lubrication and the negligible amount of wear; the segments being of solid construction and subject to only a very small movement, said to be one-eighteenth the movement of the piston. One special feature of the arrangement is that any danger of the pistons overheating is prevented, it is claimed, owing to a large portion of their outer surface, and particularly the gudgeon pin ends, being in contact with the cylinder walls, so they are able to receive the benefit of the cooling water circulating in the jackets outside the latter.

Turning from the engine we come to another novel departure in motor car design, the change-speed gear, which is on entirely new lines, and also the invention of Martin Fischer. This is shown in Figs. 2 and 3, while Figs. 3, 4, 5 and 6 show the details of the mechanism. It will be seen that the place of the usual gearbox with its double train of pinions mounted on parallel shafts is taken by a drum mounted on ball bearings, the forward open end of which is provided with a series of internally-toothed rims arranged concentrically yet in different planes. It may here be noticed that Fig. 5 shows only three rings, giving that number of gear ratios, while the actual car is provided with four rings, affording that number of speeds. The primary gear shaft receives its power from the engine through the usual clutch and a universal joint, as shown by the sketch, Fig. 3, its

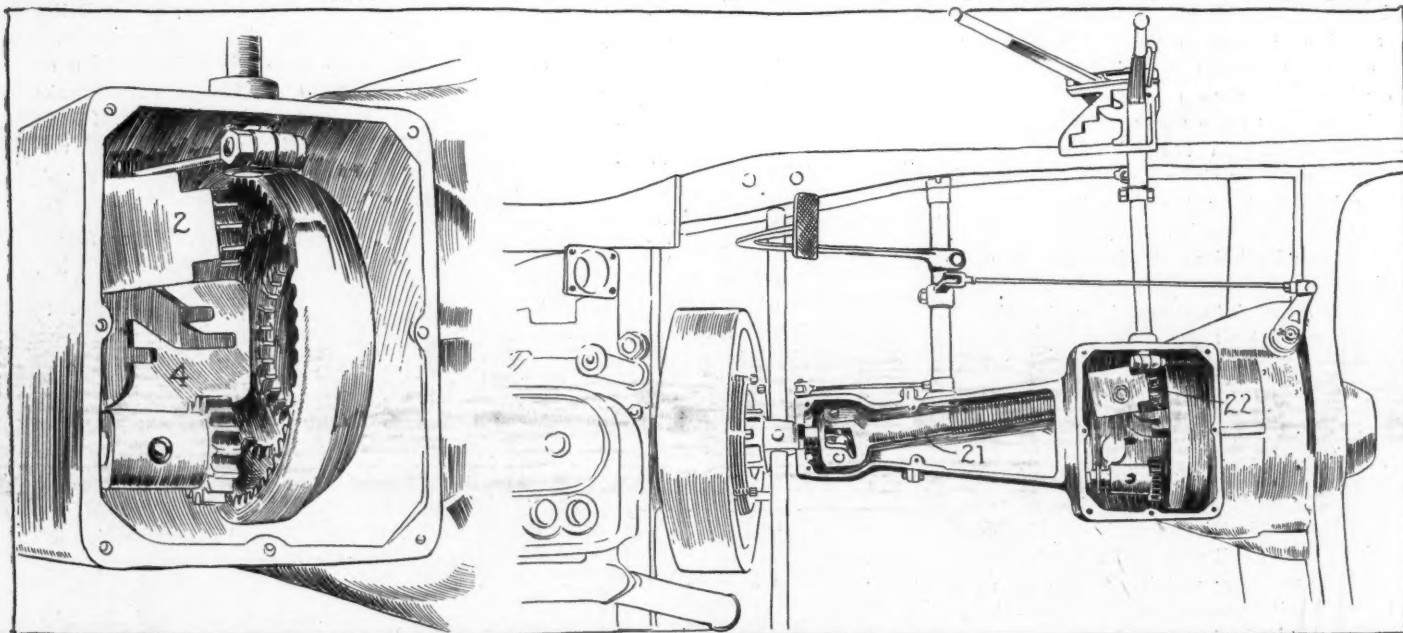


FIG. 2—ENLARGED VIEW OF CHANGE SPEED MECHANISM, SHOWING DRIVING AND SERVICE PINIONS AND GUIDE PLATE  
FIG. 3—PLAN OF FORWARD PORTION OF FISCHER CHASSIS, SHOWING DRIVE SHAFT AND PINION POSITION FOR LOW GEAR



forward end being hexagonally-shaped so that it is free to slide to and fro in a corresponding shaped sleeve forming part of the joint. The rear end of the shaft, which carries a specially shaped pinion 22, Fig. 3, is seated in the movable bearing block 2, Fig. 2, the latter in turn being supported with the guide plate and secured by bolts to the lugs in the gear casing. The guide plate is formed with a number of notches 4 according to the number of speed changes required, and the bearing block is provided with a headed pin or lug engaging in the notches of the guide plate, which forces the bearing block 2 and consequently the sliding shaft 21 forwards or backwards, as the case may be.

The gear is operated by the usual hand lever and gate quadrant, through the shaft and joint. On the first speed the pinion 22 is brought into engagement with the outer toothed ring, Fig. 5, for the second speed it is meshed with the next ring, and so on, practically a direct drive being obtained on the top speed. The toothed rim drum is rigidly connected with the short shaft, which in turn drives the back axle through an ordinary universal-jointed propeller shaft and bevel gear. The method of obtaining the reverse is shown in Fig. 4 the driving pinion being brought into engagement with a subsidiary pinion, which latter is at the same time meshed with the first speed toothed ring.

At first sight it would seem that the universal joint would be subjected to excessive use and wear; a careful examination will, however, show that the joint is only working when the lower speeds are in use, the shaft 22 being in line with the engine shaft on the top direct speed, on which the bulk of the running of modern cars is done. Between the universal joint and the bearing block 2 a spring is arranged on the shaft, which holds the block in the proper working position.

It is claimed for the new change-speed gear, which, like the engine, has been thoroughly tested, that it not only comprises one-third the number of parts of the usual sliding pinion gearbox, but that it gives an increased efficiency of at least 5 per cent, over the latter; it also is stated to run with extreme quietness and to be light.

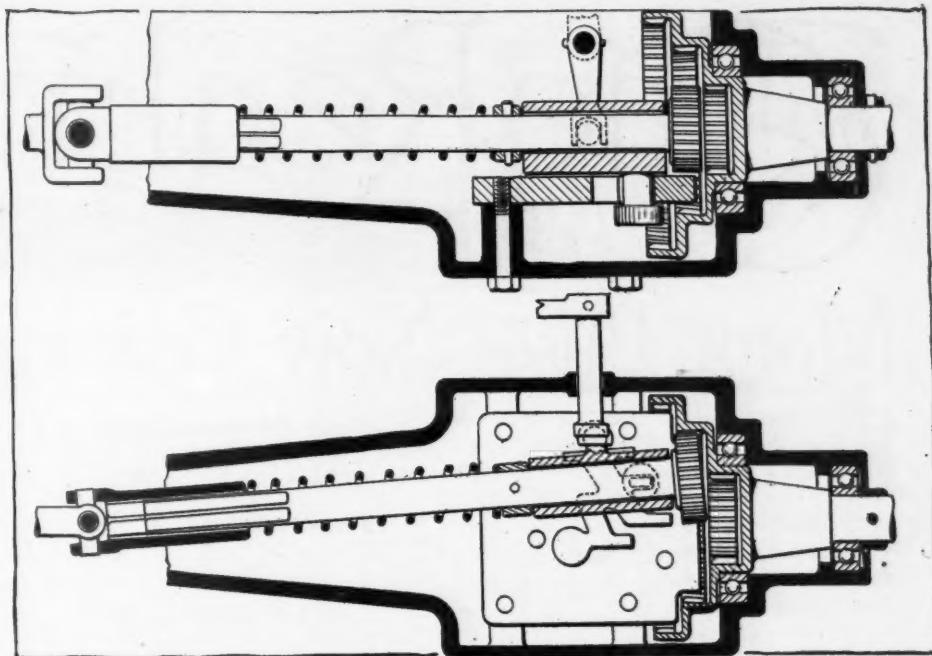


FIG. 4—SECTIONAL VIEWS OF FISCHER TRANSMISSION MECHANISM



#### Foreign Motor Cars

THE Royal Automobile Club has issued a paper-covered booklet of thirty pages containing in tabulated form a list of foreign motor cars manufactured in 1911 and 1912. In compact form the information gives the bore and stroke of the cylinders and the R. A. C. rating, and a taxation table is an additional feature of the new R. A. C. handbook.

#### Motoring in South Africa

In a little leaflet of fewer than fifty pages Mrs. H. P. Rose gives a cursory account of a trip made in company with her husband from Worcester, situated a few miles north of Cape Town, 72 miles into the hills of South Africa. She writes very enthusiastically, and the illustrations which appear on each page more than bear out the spirit of the text. Without ob-

let advertises the LeGui car. The story is told in such a way that the advertising purpose of it is lost to sight.

#### Southwest England

Among the Homeland Guide Books there come to hand the first editions of two little, paper covered, booklets of a new series. "Yelverton, Devon, and Its Surroundings" being "an appreciation of the district, and a general description of the most interesting features, together with practical details, with map of the district." A number of short tours through this picturesque section are outlined.

The other booklet, "North Walsham and the Norfolk Broads," is set forth as being "a guide to an interesting Norfolk market town and its surroundings, including the Broads." In describing the Broads, it is stated they are within easy reach from North Walsham, "the roads are good and inns and hotels are plentiful and comfortable." A sketch map of the district is included. Published by the Homeland Association, Ltd., London, Eng., they may be obtained from Frederick Warne & Co., New York, N. Y.

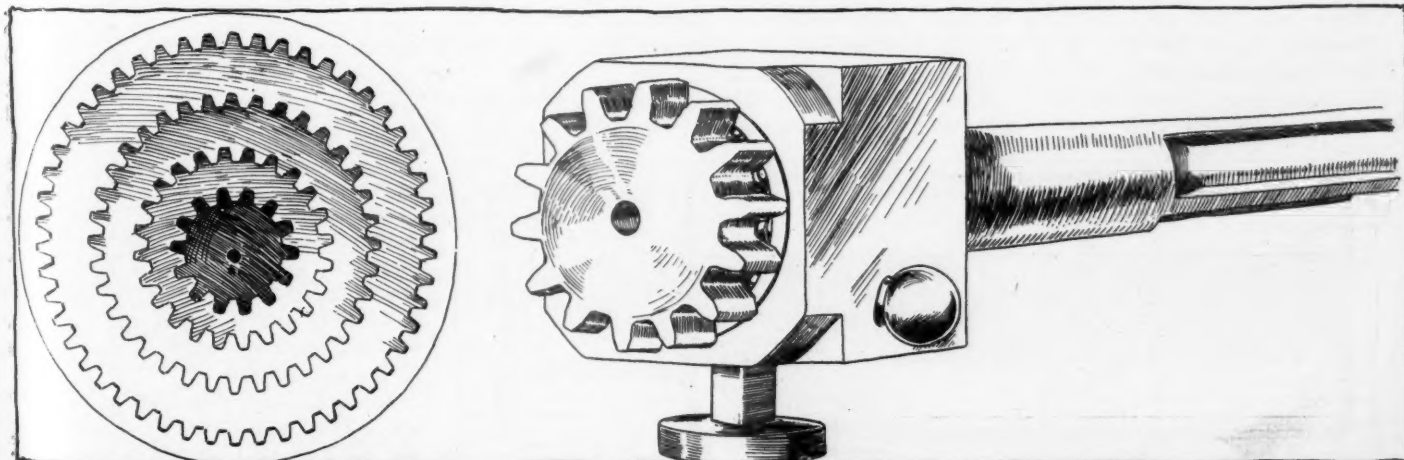


FIG. 5—FRONT VIEW OF FOUR-SPEED DRUM FIG. 6—ENLARGED VIEW OF DRIVE SHAFT AND PINION

# The Realm of the

## Motor Buses Now Gaining Firm Footing

DISCARDING more than 18,000 horses and throwing away 2,030 horse buses, the London General Omnibus Co. has adopted the motor-driven bus for all of its London work. Fifteen hundred motor buses are now carrying passengers for this company in London and at an enormous profit. In the course of 1 year 216,300,000 passengers have been carried by this firm.

Paris has discarded the horse bus for the handier and cheaper motor bus, the Compagnie Generale des Omnibus de Paris which owns the bus concession taking the last bus off its routes in March of this year. Operating at present 1,000 motor buses on the streets of Paris, this company is wonderfully equipped to operate with the least of waste and the greatest facility of service.

### Motor Buses in New York

New York, starting the use of the motor bus in 1907 with a line on Fifth avenue, has taken kindly to the new transportation and more than 7,000,000 passengers were carried by the New York buses last year. Though the foreign double-deckers were used at first, there seems to be a tendency toward the single-decker as the ultimate type. This is true abroad as well, for Paris is using the single-decker and all the new buses bought by the French company are of this type.

The latest city to take up the use of the motor bus is Chicago, the work starting with the opening last November of a motor bus service from Marshall Field's store to the new Northwestern Railway station, a run of less than a mile each way. With the experience gained, more buses were put on connecting Mandel Brothers' store and the Hub with the same station, and lately routes are being laid out covering sections of the city now connected to the loop district and the

English Metropolis Has Discarded 18,000 Horses and 1,030 Vehicles to Take Up With Modern Method of Transportation—Big French City Using 1,000 Power-Driven Public-Hire Rigs

By William B. Stout

center of the city by elevated railway and street car whereby the motor bus will compete directly with these earlier and more established means of transportation.

In the month of December last the Marshall Field buses carried more than 70,000 passengers, twelve buses operating on this route at that time. These buses are single-deckers of the pay-as-you-enter type, with the door on the right-hand side of the bus near the front. A door is fitted at the rear, but this is for emergency use only. The illustration, Fig. 1, shows the present arrangement of the bus inside with seating accommodation for sixteen passengers. The driver is on the right and all passengers entering the car pass back of him. As he collects the fare from the passengers he rings a register on the wall at his right by a cord overhead. The door at his right is within reach and has a catch which locks it in any position. It can be operated only from the inside.

These cars operate over cobble-stone pavements and on that account are arranged with special wing-nut appliances on the windows to prevent rattle. Especial care is given to this point and the cars operate very smoothly. The springs are a trifle too stiff for light loads on the roads over which the cars run, but these are being changed to meet the special requirements.

The disadvantage, from the standpoint of the driver and company, with the

present seating arrangement lies in the fact that the driver has his back to the passengers entering or leaving and hence cannot keep the watch that is advisable in case of accident, such as a passenger tripping on the step or catching a skirt. In collecting fares, too, there is an extra delay occasioned by the fact that the driver's back is toward the door.

### New Seating Arrangement

A new seating arrangement is planned for later buses with the driver, etc., arranged on the left-hand side and the door at the extreme front of the body on the right, as in the second sketch. It is planned to pivot the seat. This will give the driver the advantage of left-hand steering for traffic, and at the same time will give him a clear view of everyone entering, while the collection of fares will be simplified. This is shown in Fig. 2.

The Chicago cars run but 6 days a week and from 7:30 a. m. to 6 p. m. The Marshall Field record since November last is as follows:

December .....	3874 trips	70,295 passengers
January .....	3251 trips	57,550 passengers
February .....	2542 trips	46,000 passengers
March .....	2983 trips	50,000 passengers

Only six cars were running on this route a part of the time, which accounts for the decreasing figures. In December twelve cars were running on this route. Cars average 50 miles per day. The speed is low so that though the pavements are bad, tire trouble is reduced to a minimum. No tires have worn out since the start in December, though two have stripped rims. More routes are being added to the motor bus service as spring opens up.

The motor bus is bound to come to the big American cities and when it does will mean the elimination of a large part of the noise and congestion of the streets. It is quite probable that the bus eventually will take the place of the street car in the larger cities.

An evidence of this is shown in London, where the London County Council, operating on a capital of \$90,000,000, obtains a route mileage of only 139 miles per day,

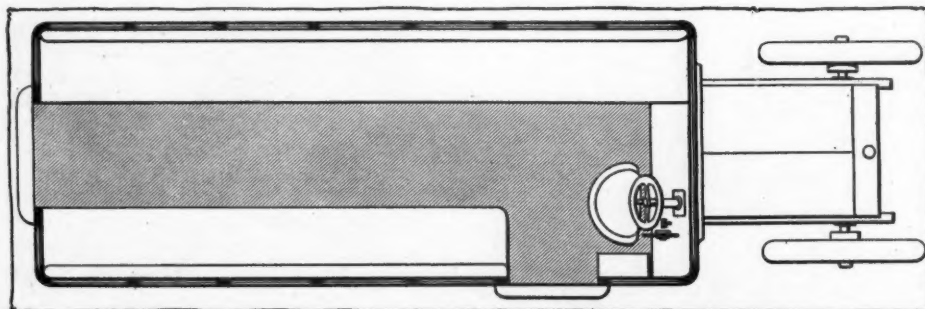


FIG. 1—CHICAGO BUS WITH PRESENT SEATING ARRANGEMENT



# Commercial Car

## in London, Paris, New York and Chicago

**Last-Named Just Becoming Initiated but Prospects Look Good  
—Big Mercantile Houses Leaders in Movement—New  
Ideas as to Seating Arrangements—Gotham  
Doing a Big Business**

whereas the General Omnibus Co. obtains a route mileage per car of 170 miles per day, with an investment of only \$11,230,000. At the same time the increase in the business of the bus company is far and away ahead of the tram lines, while the cost of running is less. In February, 1912, the General Omnibus Co. made a gain of 21 per cent over the business for the same period in 1911, whereas the gain of the tram lines was only 6 per cent.

For the week ending March 6 of this year the bus company gained 29 per cent over last year's business for the same week, while the London County Council's trams gained only 2 per cent. London company £100 shares have been selling for £485 and this year's dividend was at 8 per cent. The profits for the year of 1911 are quoted at \$2,250,000.

### London Statistics

The percentage of gain of various means of city transportation in London for a certain period last year is quoted as being 18 per cent for the bus lines, 7 per cent for the underground tubes and 4 per cent for the tram lines.

The Tillings Co. was the first London bus firm to adopt motor buses, starting the first machine in 1904, though an experimental machine was on the road some time previously.

The writer happened to be in London at the time that this first bus was tried and well remembers a certain day when he saw and heard London's first motor bus go by—or so it was reputed to be at the time. Though the writer was on the third story and at the rear of a building near Walham Green in London, the bus was heard coming in plenty of time so that there was no difficulty in getting down the three flights of stairs and out onto the sidewalk in time to join the crowd watching the bus go by. It was a slow affair and looked like a juggernaut among the vehicles of those days. Horse bus drivers for the General Omnibus Co. when questioned about it later in the day laughed at it. There are no

horse-bus drivers for the General Omnibus Co. now.

There are even drivers of horses in this country who are laughing at the motor bus now and the motor truck. It is conceivable also that there may come a time when there will be no horse drivers in many lines of work.

### Early Objections to Buses

At the start of the bus routing in London there was much opposition from residents along routes, who objected on the grounds of noise and unsightliness. This was a cause for objection then. There are no touring cars today on the streets which run sweeter and quieter than many of the giant motor buses of London, though they operate on hard tires. These buses operate at a cost of about 20 cents per mile. Some of the newer types with electric transmissions operating for the Tillings lines are running, it is claimed, at a cost of about 15 cents per mile. This is based on actual mileage of 35,000. One of these buses now running has operated 116,000 miles in 3 years and 9 months. A certain gear-drive bus in Berlin, dubbed Charlie's Aunt, is still going after 172,500 miles and is reported by the operating company to be as good as ever. This is the result of the careful systems of overhaul practiced abroad, and due partly to the fine roads. It is general practice abroad in bus work for each bus to lay off on schedule for 1 day out of 10 for a casual overhaul and inspection. Every month a complete overhaul is undertaken.

In comparison with European figures it costs the New York company 38 cents per mile to run its buses. The earning capacity on the Fifth Avenue line is given as 45 cents per mile, on the Riverside drive run at 32 cents per mile. The Riverside run is not yet paying, according to these figures.

The London company has added 1,000 buses to its fleet this year and is planning for 1,500 more next year. It operates its own factory and all allied industries, even down to the laundry for oily rags. Horse buses have been scrapped and charged to revenue. By the end of this year there will be no bus route in London without its motor vehicles. What horse buses are still running in London are owned by free lances for the most part or by small companies.

The newest type of bus built by the General Omnibus Co. is known as the B specification. This is of the worm-drive type with silent-chain gearbox, which leaves but little to be desired. Double-deck vehicles are the rule in London, though single-deckers are gaining. Sixteen thousand parts are stocked by the General Omnibus Co. for its own cars. Seven hundred of these cars from its own factory are in service. In 1911 6,845,270 gallons of gasoline were consumed by the General Omnibus machines and nearly 28,000,000 miles were covered.

### New Type of Bus

With the mileage and number of machines in operation it is not a wonder that the omnibus company is making its own buses and in making them much of interest is being done. Here is a factory which does not depend for public opinion for its sales. It is absolutely free to make what, in its opinion, will give the best service, with the exception that all machines must pass the board of the London

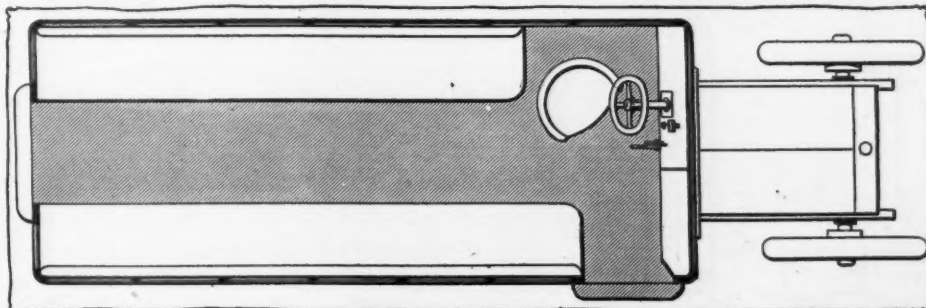


FIG. 2—CHICAGO BUS WITH SUGGESTED CHANGE IN SEATING ARRANGEMENT

County Council and the ever present noise committee. A certain weight must not be exceeded or certain dimensions and the rules are strict. Cars have been rejected for exceeding the length by an eighth of an inch and every bus that goes on the streets must first be tested for noise. Machines must be free from dirt and so arranged that oil cannot be spilled on the roadway.

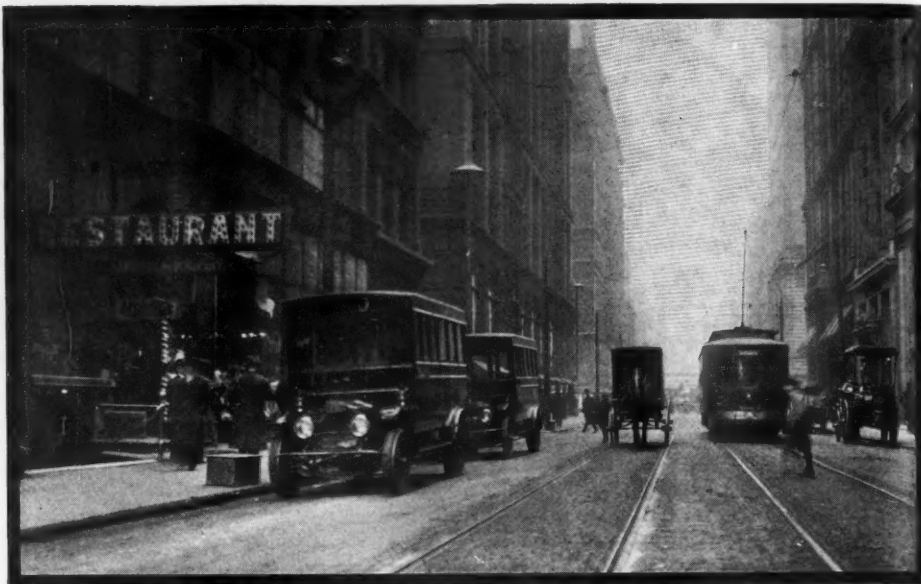
#### Special Requirements

With the special service there are special requirements. For instance, the number of gear changes is abnormal. In a recent run made from Liverpool street to the law courts, a distance of  $1\frac{1}{2}$  miles, thirty gear changes were made.

Bus operating in Paris by the Compagnie Generale des Omnibus de Paris is equally if not more interesting in its arrangement and working than the London installation.

Horse buses were abolished here in March of this year and single-decked buses are the rule, mostly Schneiders and de Dions. The company operated twelve garages, inspecting the cars every night. Every 10 days there is an inspection of the get-at-able parts, taking 4 to 5 hours and every month there is a complete overhaul when motors are taken down, pistons scraped and weak parts replaced.

Fuel is supplied to the buses at stations along the routes. Drivers are mostly old drivers of horsed buses, for in France, of all countries, a knowledge of street conditions is imperative. Drivers never are expected to touch machinery, but in case of trouble call for a repair man by telephone. There are 520 buses of thirty-five-passenger capacity operating, arranged for sixteen first class and nineteen second class; 120 with twelve seats for the first class passengers and twenty-three for second class; 100 twenty-eight seaters reconstructed from older machines, and 260 thirty-one-passenger machines, twelve first class and nineteen second. Three hundred of the machines ordered of late are de Dions; 263 are now running. There is no speed limit for motor buses in Paris, but 22 kilometers or  $13\frac{3}{4}$  miles per hour is their limit.



WHITE MOTOR BUS USED IN CHICAGO

There are forty bus routes averaging  $6\frac{1}{2}$  kilometers in length—about 4 miles—and the average day's run is 116 kilometers—72½ miles. Some of them cover 180 kilometers—112½ miles—per day. Eight miles per hour is the average speed through Paris.

#### Motor Bus in America

The motor bus is coming to America and when more generally adopted will be a factor in the comfort and convenience of city life. It is those who can see ahead who profit. One of the greatest factors toward the rapid development of the motor bus abroad has been the attitude of the police and it is interesting to note the difference between the foreign and American ways of handling problems which bear directly on the city's welfare and the comfort and convenience of its citizens.

From the outset of the bus adoption the police of London have been in hearty sympathy with the movement and in spite of many protests from minor committees of citizens have steadfastly aided in the advancement of the newer transportation. How wise their course was is evidenced

already. At the same time, while encouraging buses, there has been an insistence toward an ultimate ideal of development and toward this car the bus is tending. Every year buses must pass stricter qualification tests before being admitted to the streets, but with the better bus more leeway in other lines can be allowed them in their operation.

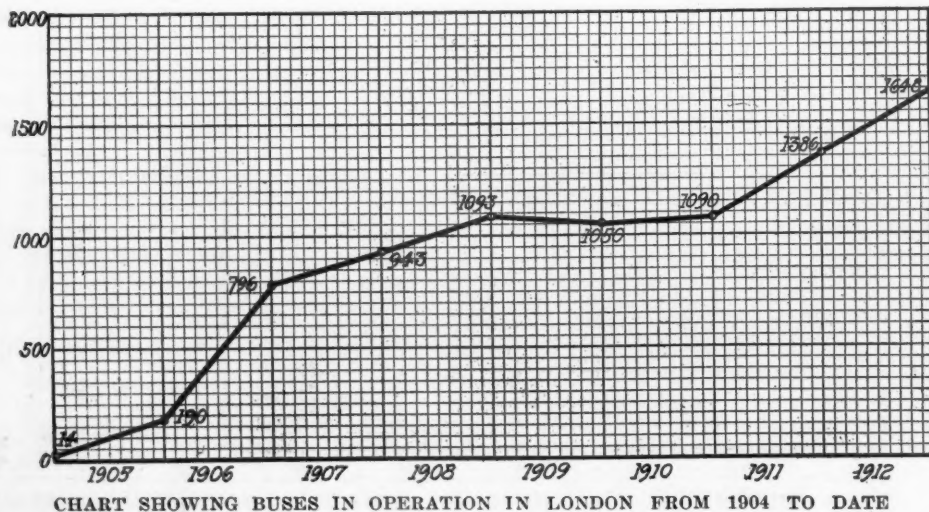
The attitude of the Berlin police toward the new transportation systems is evidenced by their edict regarding taxicabs and horse cabs. The chief of police of Berlin announced that in view of the obsolete nature of horsed cabs they would not be allowed to ply for hire in Berlin after March 31 of this year. Each licensed driver now operating a horsed cab who loses thereby will be recompensed by the city to the extent of about \$148 and encouragement is given for them to learn to drive motor vehicles. Auto of London applying this decree to London's own problems says:

#### Eliminating the Horse

"This sets an example which we should like to see followed in London. The cab driver is, in a sense, a public servant—licensed by the public authorities for the service of the public—and as such it is surely nothing less than right that he should receive some sort of preferential treatment when, as must soon be the case in London, the licensing authority has to decide that he and his vehicle as a combination have become obsolete and must go.

"It is worth thinking out."

The Morning Post, of London, recognizing the problem of the passing of the London horse, announces a committee that is being formed to administer funds on behalf of London cab horses and drivers. That it has met with favor by the public only emphasizes how widely is felt the movement toward abolishing the horse in our cities in favor of buses and trucks and how great the influence of the motor





# Getting the Most Out of Motor Trucks

has become abroad. If the example set by both Berlin and London is followed by other big cities it will not be long until the motor bus will reign supreme as a public conveyance. There is every evidence that the time is not far distant when this will be so.

## CO-OPERATIVE MOTOR SERVICE

Plans are being worked out for the merging, in case of extreme necessity of the fire departments of South Bend, Mishawaka, Goshen and Elkhart, cities in northern Indiana. The scheme has originated with Mayor Chester, of Elkhart, who suggests that the four cities shall be joined by well-kept macadam roadways. Motor apparatus is now in use in each of three cities, while Goshen in a short time will have similar apparatus in service. The scheme will be presented to the commissioners of the different counties, who will be asked to undertake the improvement of the necessary highways at once. Mayor Chester has worked out the following proposed schedule:

	Miles.	Time.
South Bend to Goshen.....	25	37:30
South Bend to Elkhart.....	15	22:30
South Bend to Mishawaka.....	4	6:00
Mishawaka to Goshen.....	21	31:30
Mishawaka to Elkhart.....	11	16:30
Elkhart to Goshen.....	10	15:00

## TRUCK SHOW FOR CHICAGO

Having given up the idea of a commercial vehicle show in the Coliseum, the Chicago Automobile Trade Association's commercial vehicle section today held a meeting and decided to promote an outdoor truck show the last week in August. The dealers have in mind using Grant park, which is located on the lake front from Park row to Randolph street, but before this can be done they will have to secure permission from the south park commissioners, who will be waited upon by a C. A. T. A. committee shortly.

## Keep Rigs Moving so Motion Minutes Will Exceed Stopped Time, Says One Car Expert

By F. R. Harding

Peerless Motor Car Co.

**M**OST of those who are in any degree familiar with motor trucking will accept it as an established fact that the better motor trucks are efficient from the stand-point of machinery and that they are capable of doing much more work than horses.

The real problem in motor trucking now concerns the reformation and re-adjustment of conditions and customs that have grown up around beast haulage, so that the truck may have full play in the realization of its potential efficiency. It is a simple matter of saving time, of keeping the truck moving so that its motion minutes will exceed to the largest possible extent, its stopped time.

Arnold Bennet calls time 'the raw material of everything.' It is indeed the raw material of motor truck service. But this should not be misunderstood. It does not mean that the truck should be speeded up. Under favorable conditions our present normal truck speeds of 10 to 15 miles an hour are sufficient to revolutionize our street and highway transportation.

The problem is to reduce the truck's stopped time by bringing the efficiency of the methods used in loading and unloading up to the efficiency of the truck. It includes also such traffic arrangements as will permit the truck to proceed at its normal speed through the streets.

Other transportation agencies are affected by the same conditions. Louis D.

Brandeis has recently attributed one of the greatest leakages in the system of railroad management to the needless stopped time of rolling stock in the yards. The great ore and grain boats which ply on the great lakes owe their efficiency very largely to the fact that they are loaded and unloaded with amazing speed. Ten thousand tons of ore has been put into one of the great carriers of the Pittsburgh Steamship Co. in 25 minutes—it always is done in less than 2 hours. The same cargo is unloaded in from 3½ to 5 hours.

Quick work at the terminals is just as valuable in the operation of the motor truck. Delays are costly not alone because they mean a tied-up investment, but because they rob the truck of an opportunity to create values, what the economists call place values, in excess of the amount represented by interest on the truck investment.

Successful co-operation in motor trucking is a three-cornered affair. It must include the shipper, the truck operator, and the receiver, whether all three happen to be parts of a single company, or are separately managed. The more complete the co-operation is the more work the truck will do, and the greater will be its value.

One firm of building supply dealers with which I am acquainted, by making an investment in hoppers and other quick-loading devices, has increased the efficiency of its trucks far beyond what was necessary to make the equipment pay for itself. But at the other end of the truck trips it has beast haulage conditions to contend with.

Building contractors still are blind to the advantages of co-operating with the dealer in his truck operation. They place their concrete mixers in places inaccessible to trucks. Thus they delay the unloading process, reduce the motion minutes of the truck, and impair its efficiency. By so doing they are also delaying their own deliveries.

Retailers who receive motor truck deliveries from wholesale houses are equally indifferent to their own interests, chiefly because they do not realize what motor truck service means to them, or might mean to them. By tardy receipt of consignments they keep the truck standing idle, delaying freight for the next man on the route as the one before delayed theirs. Co-operation here would keep things moving for the benefit of everyone.

Wharves for the exclusive use of motor trucks would be a great help at water shipping points. Trucks are now delayed by slow-moving teams. Suitable hoisting devices installed on such wharves would greatly reduce the truck's stopped time.

Trucks need never rest as horses do and idleness means nothing but loss. The Society for the Prevention of Cruelty to Animals asks no more consideration for a



SAURER BUS OPERATING IN CHICAGO



DENVER CONCERN USES TRUCK TO CARRY WORKMEN

motor truck than for a compound locomotive.

Our greatest truck problem, to sum up, concerns not the truck itself, but the manner of its use. We need to key every feature of the transportation system up to the efficiency of the truck. The motor truck has been so badly needed for the last decade that it will not take long to work the problem out when its importance is thoroughly understood. The wonderful things already accomplished by the motor truck bring home the necessity of the solution.

#### LINCOLN LIGHT DELIVERIES

Models 29 and 27 are being pushed by the Lincoln Motor Car Works of Chicago, the first named having a platform body and the latter an inclosed body. The motor used in both is a two-cylinder air-cooled horizontally opposed, with  $4\frac{1}{2}$ -inch bore and 4-inch stroke. The wheelbase in each instance is 87 inches. Either 38 by 2-inch cushion or 34 by  $3\frac{1}{2}$ -inch pneumatic tires are fitted. The open body with flare boards on model 29 has a space 5 feet long, 37 inches wide and 10 inches high back of the seat and its capacity is 800 pounds. The panel top body on model

27 is 54 inches long back of the seat, 40 inches wide and 55 inches high.

The Lincoln motor is constructed to make overhauling easy. The cylinders not only are bolted to the crankcase, which permits of easy removal, but the cylinder heads also are removable. The cylinder heads screw in, thus avoiding the use of gaskets.

#### DENVER FORESIGHT

The United States Zinc Co., with works near Pueblo, Colo., has begun an interesting experiment. The company's workmen live in Pueblo, and in order to reach the scene of their work they have a hard walk of  $2\frac{1}{2}$  miles. Believing that if they were saved the physical exertion of walking this 5 miles each day they would be much more efficient in their labor in the factory the company had a large passenger body with a capacity of twenty-eight fitted on a Packard chassis. The car will be placed in service to carry the men back and forth from their homes. The men will be charged a 5-cent fare, but the company expects to make no profit on the venture.

Since there are three shifts of men being employed at the works the car will be in constant service from 4 a. m. to 11 p.

m. and in that time it will make approximately fourteen round trips.

The Brown Brothers Mercantile Co., of Denver, has bought a truck having interchangeable bodies for hauling merchandise to the various retailers throughout the city. A driver of one of the company's old horse-drawn trucks has been trained to handle the new vehicle and another man is sent out on the trips to arrange the orders between stops for the quickest possible delivery. With this system goods are being delivered in less than 1 hour over a territory which took more than 5 hours to cover with horses. While the truck is out the other body is loaded for the next trip and on its return the empty body can be removed and the loaded one put on the chassis in about 7 minutes. It is estimated that the truck does the work of nine horses.

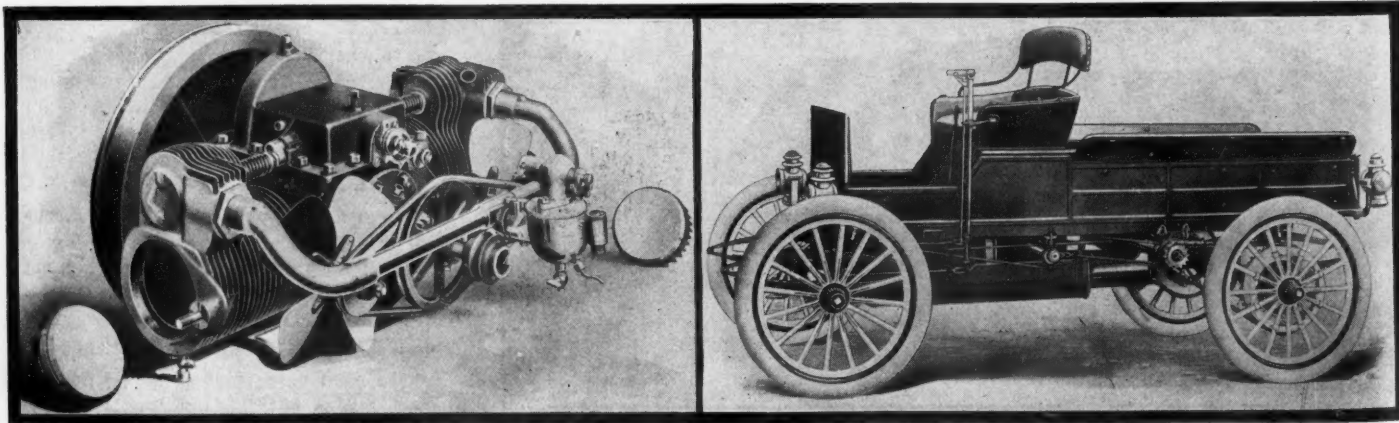
#### NEW YORK BREWER WON OVER

The horse as a transportation factor has received another setback. Proof that the motor truck will eventually do all city hauling is evidenced by the recent action of the Doelger brewing plant of New York which has entirely discontinued the use of horses and has turned the entire delivery service over to motor trucks.

This change, however, was not made in a day. Firms which have in the past suddenly dropped horse delivery and as suddenly adopted a fleet of trucks have invariably failed in the attempt through not understanding the operation of trucks and what was necessary to make them pay. Mr. Doelger bought his first motor truck 3 years ago. At the time he had over seventy horse trucks working and 175 horses.

Starting with an electric, he has added to the fleet gradually and as the system warranted until today he is operating thirty-eight electric trucks and eight gasoline, with sixteen more electrics being made for his orders.

In taking the recent step Mr. Doelger has the distinction of being the first brewer to entirely dispense with horses. Some time ago when only thirty trucks were operating Jean E. Blaize, his traffic manager was quoted as saying that these vehicles saved the firm \$25,000 per year



LINCOLN POWER PLANT AND MODEL 29, LINCOLN LIGHT DELIVERY



over horse costs for the same service. On this basis his present saving should not be far from \$40,000 per year. Additional saving has been effected in space by doing away with a barn 200 by 100 feet on half of which a bottling and shipping building has been erected. From the space left from the stable plat and yards attached the company has left a space equal to ten city lots.

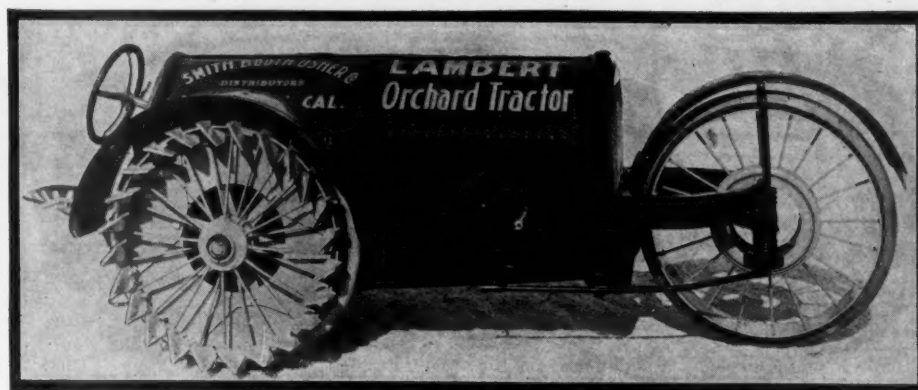
The firm of Jacob Ruppert in the same line is tending toward the same end though with seventy-two electric and twenty-one gas cars, there are still 100 horses in use for this firm. This number is fast diminishing.

#### COST OF MOTOR ENGINE UPKEEP

James McFall, chief of the fire department at Roanoke, Va., has made a report on the cost of operating motor fire engines for 5 months. Gasoline and oil for 5 months cost \$51.93; minor repairs, \$34.40; total cost of three machines for 5 months \$86.33. These machines take the place of six horses and would have cost \$15 per horse per month based upon the actual cost of the horse-drawn engines, or a total for 5 months of \$450. This represents a saving of \$363.67.

#### TO REGULATE TAXIS

As a result of recommendations made by Police Commissioner Fred O. Clapp, of Springfield, Mass., Aldermen E. S. Goldwaite and H. G. Waters have been appointed a committee to investigate taxicab conditions throughout the city. For more than a year taxicabs have been in use in the city without being subject to any regulations. The aldermen conferred with Victor M. Frost, the largest taxicab owner in the city, and they found him willing to have regulations put in force. He has suggested that the same rates that now apply to hackney cabs be applied to taxis, with the amendment that the rate for taxis by the hour be \$3 straight instead of \$2 for the first hour and \$1.50 for each hour after, the rule



LAMBERT ORCHARD TRACTOR

for hackney cabs. He said he did not believe that the meters would be satisfactory.

#### LAMBERT ORCHARD TRACTOR

The motor has invaded the orchard and the Buckeye Mfg. Co. of Anderson, Ind., has put out the Lambert orchard tractor for the use of the scientific farmer. It is a three-wheeler, which gives it a short turning radius; it is but 42 inches high so it can operate under the trees and traction is had by means of cleated rear wheels, which are self-cleaning. It is claimed that it is possible to plow at from 1½ to 2 miles per hour and it can haul loaded wagons at the rate of 6 miles per hour. A pulley is part of the equipment and if desired the tractor can be used as a power plant. A 40-horsepower four-cylinder vertical engine is employed and of course friction drive is utilized.

#### INDIANAPOLIS CELEBRATING

Mayor Shank, of Indianapolis, Ind., has announced plans for a municipal parade on May 1, to celebrate the recent reduction in fire insurance rates by fire insurance companies. The reduction will amount to something more than \$100,000 annually, and was brought about by the recent improvement in the fire department.

The fire department has added a large

amount of motor equipment and has erected three new fire-engine houses, necessitating the employment of fifty additional firemen. The new motor apparatus includes two Packard squad wagons; a Mais ladder truck; an American La France combination pump and hose; two American La France combination hose and chemical wagons and a Premier touring car for the fire chief. On account of the increased facility in reaching fires promptly, the insurance companies made a decided concession in rates for the whole city.

The mayor says the parade will also be for the purpose of showing how other city departments have been improved by the installation of motor apparatus during the present administration. This has included two Packard patrol wagons and a Premier touring car for emergency calls in the police department; a Premier touring car for the board of public works; three Buick runabouts, a Penn roadster and a Reo runabout in the street cleaning, street commissioners' and asphalt repair departments; two Reo trucks in the city engineering department; an Oldsmobile ambulance in the city hospital service and a Waverley electric ambulance for the city dispensary.

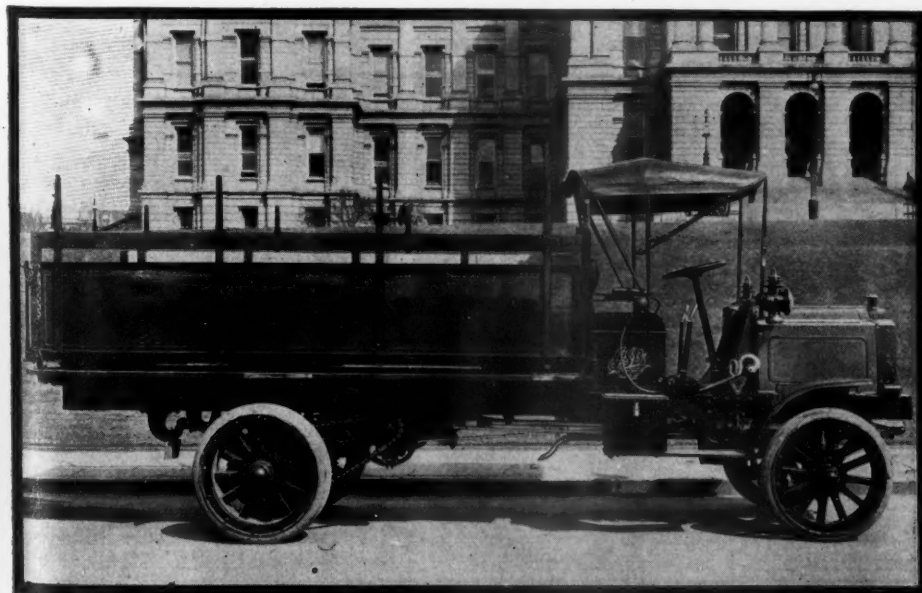
The event is to be made a half holiday in the city and the mayors and city councils of all Indiana cities have been asked to participate.

#### UNDERTAKERS PREFER MOTOR

At the annual meeting of the Hearse Builders Association of America which was held in Columbus, O., recently, preference was freely expressed for the motor cars as against the horse-drawn vehicle. It was said that the essentials in the motor for use in hearse were quietness, efficiency and slowness. C. F. Myers, of Columbus, is president of the association which is now interested in motors.

#### WATERBURY HAS TAXIS NOW

Waterbury, Conn., is the latest New England city to become addicted to the use of taxicabs, the E. H. Towle Co. having purchased three 28-horsepower cabs for its service, which will be run under the regulations and rates of the regular horse-drawn cabs. Other new England towns also are interested.



TRUCK WITH CONVERTIBLE BODY USED IN DENVER

# The Mathematics of Motoring

**P**ISTON displacements and cylinder capacities are usually stated in European practice in cubic centimeters instead of in cubic inches. A cubic centimeter is approximately 1-16 cubic inch. To be exact, there are 16.383 cubic centimeters in 1 cubic inch, so that to change the metric measurement of capacity from cubic centimeters into cubic inches it is necessary only to divide by 16.383. If, as is sometimes the case, the capacity is stated in cubic millimeters it may be changed to cubic inches by dividing by 16383.0, since there are 1,000 cubic millimeters in a cubic centimeter.

Another measurement of capacity with which we often come in contact in reading of European motoring events is the liter, which is used in the same way as a gallon. One liter is equal to approximately  $\frac{1}{4}$  gallon, .2642 gallon exactly; consequently to change liters to gallons it is necessary only to multiply the number of liters by .2642. To change liters to cubic inches, multiply by 61 and to change to cubic feet multiply by .035.

The metric measurement of weights corresponding to the English pound is the kilogram and equals 2.2 pounds; so to change kilograms to pounds it is necessary only to multiply by 2.2. To convert pounds to the metric equivalent, divide the number of pounds by 2.2 or multiply it by .454, which gives the equivalent in kilograms.

The most usual measurement of length aside from the millimeter, the conversion of which into English equivalents was given last week, is the kilometer. This measurement corresponds to the English mile, but is only a little over half as great, as 1 kilometer is equal to .62 English statute miles, or 3,280.7 feet. The conversion of kilometers to miles means

## Metric Equivalents

### COMMON METRIC CONVERSIONS

#### MEASURES OF LENGTH

Millimeters  $\times .03927$  = inches  
 Millimeters  $\div 25.4$  = inches  
 Centimeters  $\times .3937$  = inches  
 Centimeters  $\div 2.54$  = inches  
 Meters  $\times 39.37$  = inches  
 Meters  $\times 3.281$  = feet  
 Kilometers  $\times .621$  = miles  
 Kilometers  $\times 3280.7$  = feet

#### MEASURES OF AREA

Square millimeters  $\times .00155$  = square inches  
 Square millimeters  $\div 645.1$  = square inches  
 Square centimeters  $\times .155$  = square inches  
 Square centimeters  $\div 6.451$  = square inches  
 Square meters  $\times 10.764$  = square feet

#### MEASURES OF CAPACITY

Cubic centimeters  $\div 16.383$  = cubic inches  
 Cubic meters  $\times 35.315$  = cubic feet  
 Cubic meters  $\times 264.2$  = gallons (231 cubic inches)

Liters  $\times 61.022$  = cubic inches  
 Liters  $\div .2642$  = gallons (231 cubic inches)  
 Liters  $\div 3.78$  = gallons (231 cubic inches)  
 Liters  $\div 28.316$  = cubic feet

#### MEASURES OF WEIGHT

Grammes  $\div 28.35$  = ounces avoirdupois  
 Kilograms  $\times 2.2046$  = pounds  
 Kilograms  $\times 35.3$  = ounces avoirdupois  
 Kilograms  $\div 1102.3$  = tons (2000 pounds)

#### MISCELLANEOUS MEASURES

Kilowatts  $\times 1.34$  = horsepower  
 Watts  $\div 746$  = horsepower  
 Calorie  $\times 3.985$  = B. T. U.  
 Cheval vapeur  $\times .9863$  = horsepower

#### COMPOUND MEASURES

Meter per second = 196.86 feet per minute  
 Grammes per cubic centimeter  $\div 27.7$  = pounds per cubic inch  
 Kilograms per square millimeter  $\times 1422.3$  = pounds per square inch  
 Kilograms per square centimeter  $\times 14.223$  = pounds per square inch

simply to multiply the number of kilometers by .62.

In the tables below the equivalent English measurements from 1 to 109 of four of the most usual metric quantities are given. To use these tables it will be found that the metric quantity is given in the first column, while the other ten columns give the English equivalents. For instance, in the table showing the conversion of kilometers into English statute miles the equivalent of 20 kilometers will be found in the second column

under Miles 0, and opposite 20 in the first columns under Kilometers; that is, 20 kilometers, from the table, equals 12.427 miles. In the same way 21 kilometers will be found in the third column opposite 20 under Miles 1 and equals 13.049 miles. Thus it will be seen that to find the English equivalent of the metric quantity it is necessary to look under the column headed by the last figure of the quantity desired; for instance, the equivalent of 79 cubic centimeters in cubic inches is found in the eighth horizontal line opposite 70 and in the tenth vertical line under 9 and equals 4.8210 cubic inches. In the first line of the second column of the table under 1 and opposite 0 is given the equivalent of 1 in the metric systems. For instance, the exact equivalent of 1 kilogram is seen to be 2.205 pounds. This method of tabulation seems confusing at first glance, but is very simple when tried and has the merit of permitting a complete table to be given.

In addition to the simple metric quantities which have been given, there will be encountered a number of compound quantities which can all be converted into English compound quantities quite readily. For instance, to change kilograms per square millimeter into pounds per square inch it is only necessary to multiply the kilograms by 2.2046, which will give pounds per square millimeter, and then multiply by 645.1, the number of square millimeters per inch. This will give the equivalent of pounds per square inch. This can be done more quickly by taking the product of 2.2046 by 645.1 or 1422.3, which will convert the metric into the equivalent English unit for pressure directly. That is, kilograms per square millimeter multiplied by 1422.3 equals pounds per square inch.

### CONVERSION OF KILOMETERS INTO STATUTE MILES

Kilom.	0	1	2	3	4	5	6	7	8	9
0	0.0000	0.6214	1.2427	1.8641	2.4855	3.1069	3.7282	4.3497	4.9711	5.5924
10	6.2138	6.8352	7.4565	8.0780	8.6994	9.3208	9.9421	10.562	11.185	11.805
20	12.427	13.049	13.670	14.292	14.913	15.534	16.156	16.776	17.399	18.019
30	18.641	19.263	19.884	20.506	21.127	21.748	22.370	22.990	23.613	24.233
40	24.855	25.477	26.098	26.720	27.341	27.962	28.584	29.204	29.827	30.447
50	31.069	31.690	32.311	32.933	33.554	34.175	34.797	35.417	36.040	36.660
60	37.282	37.904	38.525	39.147	39.768	40.389	41.011	41.631	42.254	42.874
70	43.497	44.118	44.739	45.361	45.982	46.603	47.225	47.845	48.468	49.088
80	49.711	50.332	50.953	51.575	52.196	52.817	53.439	54.059	54.682	55.302
90	55.924	56.545	57.166	57.788	58.409	59.030	59.652	60.272	60.895	61.515
100	62.138	62.759	63.380	64.002	64.623	65.244	65.866	66.486	67.109	67.729

### CONVERSION OF CUBIC CENTIMETERS INTO CUBIC INCHES

Cu. cm.	0	1	2	3	4	5	6	7	8	9
0	0.0000	0.0610	0.1221	0.1831	0.2441	0.3051	0.3661	0.4272	0.4882	0.5492
10	0.6102	0.6712	0.7323	0.7933	0.8543	0.9153	0.9763	1.0374	1.0984	1.1594
20	1.2205	1.2815	1.3426	1.4036	1.4646	1.5256	1.5866	1.6477	1.7087	1.7697
30	1.8308	1.8918	1.9529	2.0139	2.0749	2.1359	2.1969	2.2580	2.3190	2.3800
40	2.4410	2.5020	2.5631	2.6241	2.6851	2.7461	2.8071	2.8682	2.9292	2.9902
50	3.0513	3.1123	3.1734	3.2344	3.2954	3.3564	3.4174	3.4785	3.5395	3.6005
60	3.6615	3.7225	3.7836	3.8446	3.9056	3.9666	4.0276	4.0887	4.1497	4.2107
70	4.2718	4.3328	4.3939	4.4549	4.5159	4.5769	4.6379	4.6990	4.7600	4.8210
80	4.8820	4.9430	5.0041	5.0651	5.1261	5.1871	5.2481	5.3092	5.3702	5.4312
90	5.4923	5.5533	5.6144	5.6754	5.7364	5.7974	5.8584	5.9195	5.9805	6.0415
100	6.1025	6.1635	6.2246	6.2856	6.3466	6.4076	6.4686	6.5297	6.5907	6.6517

### CONVERSION OF LITERS INTO U. S. GALLONS

Liters	0	1	2	3	4	5	6	7	8	9
0	0.0000	0.2642	0.5284	0.7925	1.0567	1.3209	1.5851	1.8492	2.1134	2.3776
10	2.6418	2.9060	3.1702	3.4343	3.6985	3.9627	4.2269	4.4910	4.7552	5.0194
20	5.2836	5.5478	5.8120	6.0761	6.3403	6.6045	6.8687	7.1328	7.3970	7.6612
30	7.9254	8.1896	8.4538	8.7179	8.9821	9.2463	9.5105	9.7746	10.0388	10.3030
40	10.567	10.831	11.095	11.360	11.624	11.888	12.152	12.416	12.680	12.945
50	13.209	13.473	13.737	14.002	14.266	14.530	14.794	15.058	15.322	15.587
60	15.851	16.115	16.379	16.644	16.908	17.172	17.436	17.700	17.964	18.229
70	18.492	18.756	19.020	19.284	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.191	22.455	22.719	22.983	23.247	23.512
90	23.776	24.040	24.304	24.568	24.832	25.097	25.361	25.625	25.889	26.154
100	26.418	26.682	26.946	27.210	27.475	27.739	28.003	28.267	28.531	28.796

### CONVERSION OF KILOGRAMS INTO POUNDS

Kilograms	0	1	2	3	4	5	6	7	8	9
0	0.000	2.205	4.410	6.615	8.820	11.025	13.230	15.435	17.640	19.845
10	22.050	24.255	26.460	28.665	30.870	33.075	35.280	37.485	39.690	41.895
20	44.100	46.305	48.510	50.715	52.920	55.125	57.330	59.535	61.740	63.945
30	66.150	68.355	70.560	72.765	74.970	77.175	79.380	81.585	83.790	85.995
40	88.200	90.405	92.610	94.815	97.020	99.225	101.430	103.635	105.840	108.045
50	110.250	112.455	114.660	116.865	119.070	121.275	123.480	125.685	127.890	130.095
60	132.300	134.505	136.710	138.915	141.120	143.325	145.530	147.735	149.940	152.145
70	154.350	156.555	158.760	160.965	163.170	165.375	167.580	169.785	171.990	174.195
80	176.400	178.605	180.810	183.015	185.220	187.425	189.630	191.835	194.040	196.245
90	198.450	200.655	202.860	205.065	207.270	209.475	211.680	213.885	216.090	218.295
100	220.500	222.705	224.910	227.115	229.320	231.525	233.730	235.935	238.140	240.345





# The Motor Car Repair Shop

IN Fig. 1, is shown a very simple and ingenious means to facilitate soldering metal carbureter floats and the like. A stand is made by nailing a couple of pieces of board together so that one piece extends vertically upward. A nail is driven through the vertical piece from the back inward, and so that it inclines slightly upward from the horizontal. This nail serves as a pivot for the carbureter float, which generally has a seam in the center of its circumferential side, and to solder this seam, the float is turned with the finger of one hand, and the acid, lead and heat are applied with the other hand. The finger that turns the float is wrapped with cloth to protect the skin from the heat and the acid.

## Worn Valve Guide Trouble

After a motor has been in use for 2 or 3 years, it may be found difficult to adjust the carbureter so that the motor will run steadily at slow speeds without misfiring. The misfiring might not take place when the car is running slowly and the motor working hard, but when the load is light or the motor running idle, the misfiring may be very annoying and most difficult to locate.

This often is due to the admission of air into the fuel mixture from around the valve stems, the guides having been worn either from long service, or from carelessness on the part of the operator or repairman during the valve-grinding operations. It is very necessary that care should be taken in grinding in the valves, to see that none of the abrasive, is smeared on the valve stem, or runs down the valve stem and into the guide. Precautions also should be taken to clean the guides and stem after the grinding-in job is finished and the valve finally assembled into place. Unless these precautions are taken, unusual wear will take place between the stem and guide, and they soon will fit so poorly that considerable air will be admitted between the stem and walls of the guide.

To remedy trouble of this kind, one either must provide some means of packing the end of the valve guide; fit new valves with larger stems, or most preferably fit new guides. New guides may be readily obtained from almost any dealer, or from the manufacturer, and but little fitting is necessary to replace them. In some motors the guides are threaded into the cylinders, but in most types, they are simply pressed in. To remove the threaded guides, it is necessary to use a wrench to remove them; but the guides that are a press fit in the valve chambers, may be very easily removed as indicated in Fig. 2. A drift D having its lower end constructed so as to fit the bore V of the

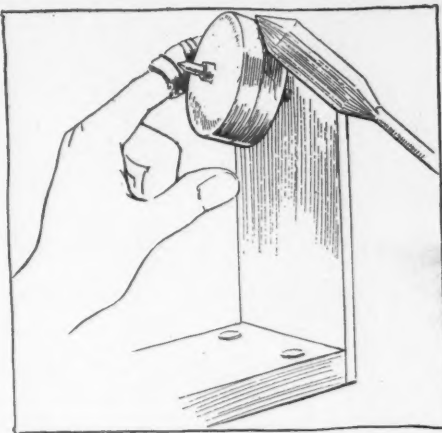


FIG. 1—SOLDERING CARBURETER FLOAT

valve guide G, is applied as shown, then a few sharp blows with a hammer H should force the guide out of the cylinder.

The new guides may be replaced in the same way if the cylinders are removed from the crankcase; but if intact, it may be impossible to use the drift advantageously. It is necessary that either a lead or copper hammer be used in driving the new guides into place, or a block of wood or soft metal be employed to protect the end of the guide from the hard surface of a steel hammer.

## Care of the Car Body

The E. R. Thomas company gives good advice to owners of its cars which can be taken advantage of by others. The beautiful piano finish used on the motor car merits more than ordinary attention so the Thomas experimental laboratories have worked out a formula for a suitable body polish. The following is the mixture recommended: One pint turpentine, 1 pint wood

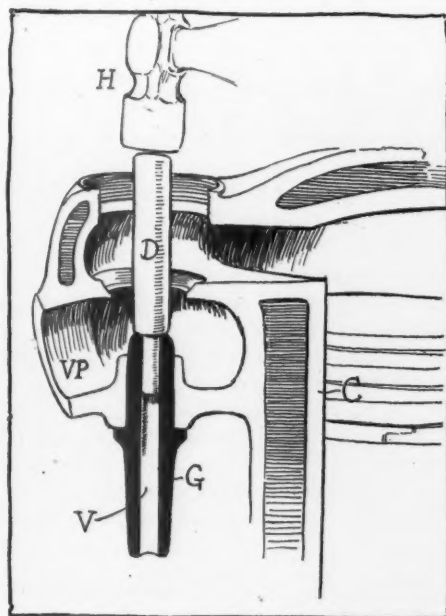


FIG. 2—REMOVING VALVE GUIDE

alcohol, 1 quart distilled water or rain water, 1 quart paraffin oil. Mix the alcohol and turpentine together, then mix the water and paraffin oil together. In order to mix the two latter ingredients it is necessary to put them together in a gallon bottle and shake briskly until they mix, then add the alcohol and turpentine, which have previously been mixed and shake until the whole is thoroughly mixed.

This mixture is apt to separate after standing, but brisk shaking will bring the ingredients together again. Apply with the soft side of a cotton flannel cloth and polish with a dry one.

The owner of a motor car often is surprised and somewhat dismayed to find that though he has hardly used the car for more than a year, it has taken on a shabby appearance. This often is due almost entirely to lack of proper care. Most motor car bodies are finished and painted by expert workmen, using high grade materials, yet by a few months of careless handling all this is undone.

## Careless Washing Harmful

The washing of a car is the most particular item with which to contend. Good paint and the best effects of the painter are ruined through careless washing. A room with a temperature of 50 degrees is the best in which to wash and keep vehicles, also one in which clear cold water can be used with freedom. In washing one should not allow the water applied to freeze, as that will crack the varnish.

After washing, the body should be dried with a soft, well-worked chamois skin. Warm water should not be used. It is not advisable to use soap, except on the under sides of the fenders and for removing grease from the running gear. It is generally claimed that the chemicals contained in the soft soap employed for motor car cleaning, will destroy the best paint or varnish made. It should be used with care, therefore, and only in the form of a suds; after which it should be quickly and thoroughly removed, or rinsed off, with cool, clear water.

Taking a vehicle from a very warm room into the extreme cold frosty or very damp air will cause the varnish to crack. The same is true when the car is taken from the extreme cold into a very warm barn or garage. Ammonia in a barn where horses are, or have been kept, will crack and turn the varnish gray. It is a good plan to have sufficient ventilation in a barn or garage with a cement floor especially in the spring when the frost comes out of the ground. Poor ventilation also will turn varnish grey. It is strongly advised that in order to keep a car in first-class condition it should be varnished every 6 months.



# From the Four Winds



TEXAS LAND AGENTS USE MOTOR CARS TO SHOW HOME-SEEKERS AROUND

**NEW Maine Club**—The Knox County Automobile and Good Roads Association was organized at Rockland, Me. The officers are as follows: Arthur E. Littlefield, president; Leslie N. Littlehale, vice-president; H. Nelson McDougall, secretary-treasurer.

**Punished for Not Stopping**—Walter Smith, a St. Paul tradesman, is the first man arrested under the new Minnesota state law for not bringing his car to a full stop after an accident. The first offense was committed by a woman in Minneapolis, wife of a motor car manufacturer. Smith ran down a boy, it is charged, in Minneapolis. Smith was sentenced to 90 days in the workhouse by a judge of the district court and was released on 90 days' probation.

**Club Has New Scheme**—The Benson Automobile Club, which originated the \$1 road post sign for Minnesota, is planning a mutual fire and burglary insurance arrangement by which the 250 motor car owners of Swift county, Minnesota, may have protection at much less than the rates which are now paid regular companies. Only \$5 each will be asked at the start if any assessment is made before the first loss is reported. To date there has been no loss of motor cars in the county.

**Insists on Guide Posts**—As the result of intimations in the public press at the instance of the Milwaukee Automobile Club that court actions would be brought against town boards which persist in ignoring the law requiring the erection and maintenance of guide posts and signboards, several townships already have bestirred themselves and are hastening to comply with the law. The M. A. C., however, will not relent in its efforts and promises prosecution for such townships which fail to comply. The Union Automobile Club, of Brodhead, Wis., is plan-

ning to signboard the principal highway from Janesville, Wis., to that city at its own expense.

**Pennsylvania Registration**—State officials at Harrisburg, Pa., figure that the value of motor cars owned in Pennsylvania is not far short from \$50,000,000. Thus far more than 36,000 licenses, including owners' and dealers' licenses, have been issued for 1912, and allowing \$1,500 as the average for each car, the total runs high. Although the season is well advanced, as high as 200 cars a day are sometimes licensed.

**Motorists Helping**—The Rochester Automobile Club, of Rochester, Minn., has a practical method for encouraging good roads in Olmsted county, appointing a club member as overseer for each road leading out of the city. Co-operation between the official pathmaster and club overseer will be sought in each case. The club overseer will look up gravel pits and seek their purchase by the county commissioners as material for road work.

**Grand Rapids Building Club House**—Plans practically have been completed for the new home of the Grand Rapids Automobile Club of Grand Rapids, Mich., and work on the structure will be begun soon. The building will be located at Plainfield, 7 miles north of Grand Rapids. It will front south, facing Grand river. The porch, from which a view of the country for 5 miles around can be obtained, will measure 115 feet along the front and will be screened, making its use as a summer dining room most acceptable. It extends around the building about 30 feet at each end, making its total length in the neighborhood of 175 feet. The main dining hall will be reserved as a dancing floor during the summer months. Exclusive of the heating and lighting apparatus and

plumbing the building will cost approximately \$25,000. A farm of considerable extent surrounds the site of the club house and under a competent superintendent there will be raised practically all the produce needed for the cafe. A fine herd of cattle already is on the place. It is expected the club house will be ready for occupancy by the middle of August.

**Joins Road Movement**—The Moorhead Automobile Club, of Moorhead, Minn., which has just started with sixty members and \$500 in the treasury for improvement work, has interested the people of Hawley in organizing the Eastern Clay County Automobile Association, with which it will co-operate in forming an effective organization for making good roads in the county leading into Moorhead.

**Improving Popular Route**—The town officials of Nahant, Mass., have appropriated \$41,000 for the improvement of the stretch of highway that connects the Lynn boulevard with the Nahant road to Bass Point, one of the roads that is very much traveled in the summer season, because Nahant has many summer residences owned by wealthy people, among them United States Senator Henry Cabot Lodge.

**Fixing Milwaukee Streets**—One of the first things accomplished by the new city administration at Milwaukee, following the ousting of the socialists, was to heed the protests of motorists and vehicle owners against the deplorable condition of the downtown streets. A dozen gangs of expert paving men were sent out on the day following the inauguration of the new mayor, Dr. G. A. Bading, to repair holes in asphalt-paved streets, and the promise is made by the new commissioner of public works, F. G. Simmons, that permanent



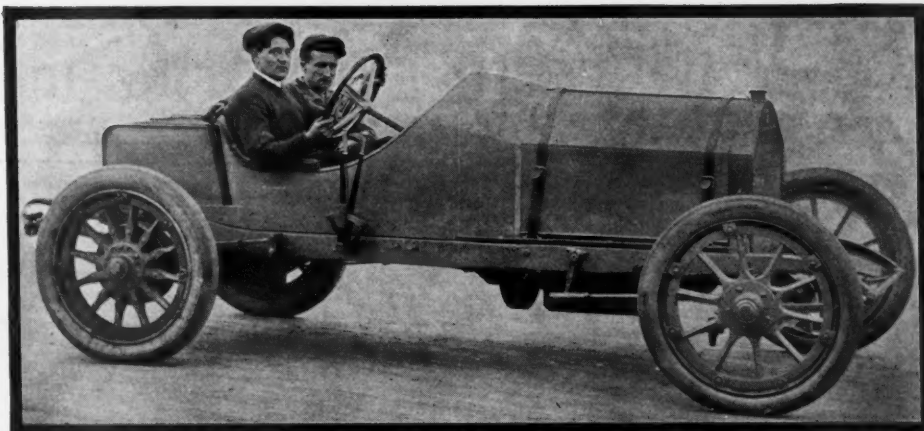
repairs and reconstruction of pavements will be taken up without delay. Contracts for about \$100,000 worth of asphalt paving were awarded last week.

**Will Have New Home**—The Automobile Club of St. Paul, which recently abandoned its summer clubhouse called the Anchorage on Lake St. Croix, has bought the McKnight property near Lake Shore, near the trolley line and a country road, situated on the shore of White Bear lake, St. Paul's summer residence district. Baths, docks and other facilities for enjoying the water opportunities are being installed.

**Syracuse Touring Plans**—The Automobile Club of Syracuse, N. Y., is preparing plans for its club runs for the coming season. There will be at least two of these; the sociability run for the Watson cup, which will be run earlier than last season, and another, the details of which are not yet settled. It is yet too early to announce routes and specific arrangements, but committees will soon have meetings to arrange details.

**Election at Torrington**—At the annual election of the Litchfield County Automobile Association held at Torrington, Conn., the following officers were chosen: John N. Brooks, of Torrington, president; E. R. Holmes, of Winsted, vice-president; Lyman B. Case, Winsted, secretary; C. B. Moore, Winsted, treasurer. These officers with the chairmen of the various committees appointed by President Brooks will comprise the board of directors. The association now has 140 members.

**Road Hog Punished**—The unusual happened this week at Bowling Green, O., when Justice Comstock of that city struck a blow for roads rights, fining Mart Ames \$5 and costs on a charge of obstructing the highway. The fine was suspended on good behavior, the defendant paying the costs, which amounted to \$17.40. The difficulty arose when Arthur Prieur, driving his motor car on the return trip from Toledo, came up behind Ames, who refused to turn his team to the side of



STUTZ ENTRY IN 500-MILE RACE AT INDIANAPOLIS

the road and frustrated all attempts on the part of the motorist to pass him on the highway.

**Kenton Club Election**—At the annual meeting of the Kenton Automobile Club, of Kenton, Ohio, the following were elected: L. S. Bixler, president; J. W. Caine, vice-president; J. H. Allen, secretary; H. L. Runkle, treasurer, and F. L. Damon, C. E. Nash, J. W. Caine, B. L. Johnson, members of the board of directors.

**Babcock Made President**—Harry Babcock has been elected president of the newly organized Twin City Automobile Club, of Neenah and Menasha, Wis. The other officers elected are: Vice-president, Charles Howard; secretary and treasurer, A. D. Paul; directors, W. L. Wheeler and W. A. Rednor. Good roads will be the principal problem to have the attention of the new club.

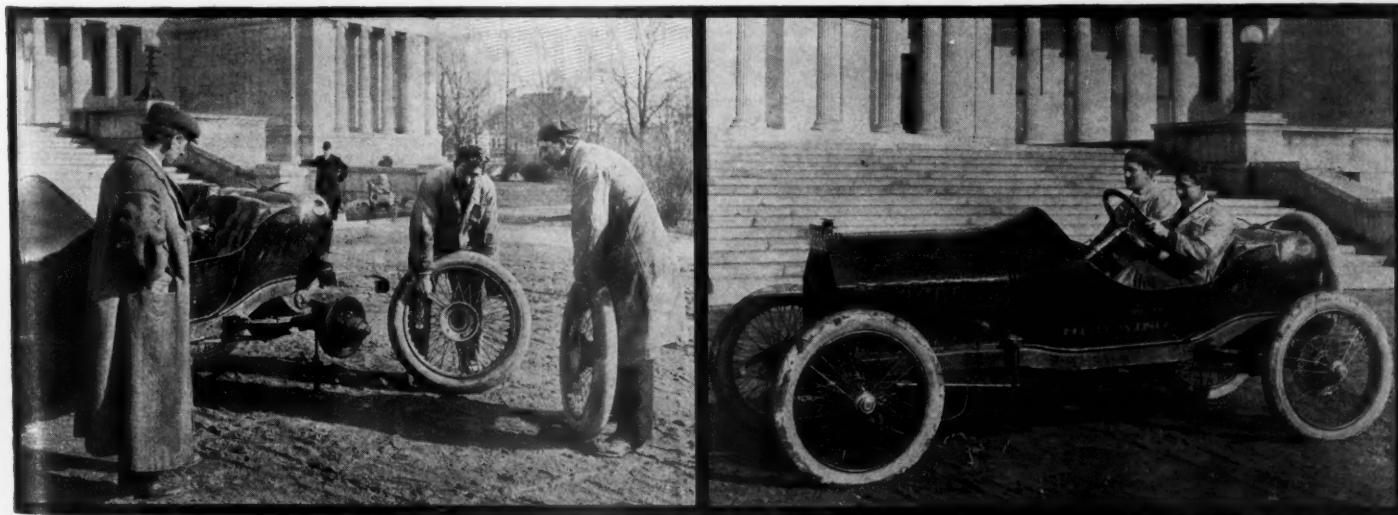
**First Over Green Mountains**—O. H. Coolidge, of Rutland, Vt., who for the past 5 years has held the honor of being the first motorist to go over the Green mountains, has won the honor again this year by traveling from Rutland to White River Junction. He made the trip in Old Worthy, the name he has bestowed upon his 1908 six-cylinder Franklin. At times

the roads were covered with big patches there was mud up to the hubs. Coolidge, though, made the trip without trouble.

**Rides for Poor Children**—Plans are being made among some fifty owners of Steelton, Pa., for the forming of an organization which will have as its aim the providing of short tours for the poor children of the borough during the summer months. A similar organization was formed last summer.

**Reliability Abandoned**—As sufficient interest in the proposed Chesapeake reliability tour could not be aroused, the Automobile Club of Washington has abandoned the project. There is some talk of holding a 3-day reliability tour the first week in June, with Harrisburg and Philadelphia the night stops.

**Columbus to Have a Meet**—President C. C. Janes, of the Columbus Automobile Club of Columbus, O., has named a committee to have charge of a race meet to be given by the club at Columbus some time in June or July. It is proposed to have as a feature a 200-mile race. The committee will arrange the details for the meet in a short time and the work of securing entries will be begun. A similar race was run last year with great success.



LEE FRAYER WILL USE MCCUE DEMOUNTABLE WIRE WHEELS ON FIRESTONE-COLUMBUS IN 500-MILE INDIANAPOLIS RACE



# Current Motor Car Patents



## PATENTS ISSUED APRIL 16, 1912.

1,023,080—Metallic Packing. Ernest Wisch, Milwaukee, Wis. Filed September 18, 1911. Serial No. 640,942.

1,023,121—Electric Lighting System. Charles E. Bonine, Philadelphia, Pa. Filed November 8, 1910. Serial No. 591,296.

1,023,122—Electric Lighting and Engine Starting System. Charles E. Bonine, Philadelphia, Pa. Filed July 7, 1911. Serial No. 637,334.

1,023,141—Fire-Fighting Apparatus. Harry W. Eisenbise, Reading, Pa. Filed April 5, 1911. Serial No. 619,093.

1,023,178—Battery Holder. Herbert A. Stevens, Malden, Mass. Filed April 5, 1911. Serial No. 619,007.

1,023,180—Ignition Apparatus for Hydrocarbon Engines. Milton Tibbets, Detroit, Mich., assignor by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed April 17, 1908. Serial No. 427,634.

1,023,212—Starting Motor Vehicle Internal Combustion Engines. Charles William Mallins, Liverpool, Eng. Filed December 2, 1908. Serial No. 465,746.

1,023,225—Muffler for Motor Cars. Maris Shlosberg, Chicago, assignor of one-half to McKenzie Cleland, Chicago. Filed June 22, 1911. Serial No. 634,713.

1,023,241—Means of Driving the Pumps of Internal Combustion Engines. Hans Th. Bruns, Nuremberg, Germany. Filed January 24, 1911. Serial No. 604,494.

1,023,259—Adjustable Bracket for Lamps. Thomas C. Luce, Dalton, Mass., assignor to Luce Mfg. Co., Dalton, Mass., a corporation of Massachusetts. Filed March 15, 1911. Serial No. 614,655.

1,023,270—Spiral Coil for Fastening Wire Terminals. Philip P. Nungesser, Cleveland, O., assignor to the Nungesser Electric Battery Co., Cleveland, O., a corporation. Filed June 9, 1911. Serial No. 632,141.

1,023,271—Fastening Device for Wire Terminals. Philip P. Nungesser, Cleveland, O., assignor to the Nungesser Electric Battery Co., Cleveland, O., a corporation. Filed June 9, 1911. Serial No. 632,142.

1,023,272—Fan. William H. Oakes, Indianapolis, Ind. Filed October 12, 1911. Serial No. 654,287.

1,023,279—Starter for Internal Combustion Engines. George B. Sinclair, Medford, Mass. Filed December 9, 1910. Serial No. 596,531.

1,023,344—Elastic Tire for Vehicle Wheels. Charles F. Waldman, Los Angeles, Cal. Filed August 7, 1911. Serial No. 642,836.

1,023,366—Power Transmitter. Edwin Fabian and Frederick Widmark, St. Paul, Minn. Filed June 6, 1910. Serial No. 565,396.

1,023,383—Clock for Motor Cars and the Like. Henry W. Matalene, New York. Filed December 9, 1910. Serial No. 596,431.

1,023,393—Fender for Motor Cars. Waldo F. Perez, Tampa, Fla. Filed May 15, 1911. Serial No. 627,233.

1,023,402—Mixer for Gaseous Fuel. Herman E. Whiting, Palmyra, N. Y., assignor to Garlock Auto Specialty Co., Palmyra, N. Y., a corporation of New York. Filed February 6, 1911. Serial No. 606,938.

1,023,414—Armor for Vehicle Tires. Jeremy B. Coonrod, Rock Rapids, Iowa. Filed February 25, 1911. Serial No. 610,892.

1,023,416—Resilient Wheel. Daniel L. Crosbie, Sacramento, Cal., assignor of one-third to Joseph D. Cornell and Victor J. Bartels, Sacramento, Cal. Filed January 16, 1911. Serial No. 602,828. Renewed October 24, 1911. Serial No. 656,485.

1,023,454—Pneumatic Tire for Vehicle Wheels. Elery Emmerson Black, Detroit, Mich. Filed March 4, 1911. Serial No. 612,243.

1,023,470—Carburetor. Raymond S. Hill and Oliver P. Underwood, Indianola, Iowa, said Underwood assignor to Herman C. Mills, Des Moines, Iowa. Filed February 28, 1910. Serial No. 546,507.

1,023,471—Motor Car Number Plate. Peter M. Hoffman, Chicago. Filed July 24, 1911. Serial No. 640,143.

1,023,493—Spark Plug. Franz Bartl, New York. Filed November 19, 1909. Serial No. 528,875.

1,023,497—Resilient Vehicle Wheel. Frank H. Beamer, Buffalo, N. Y., Filed August 29, 1910. Serial No. 579,487.

1,023,498—Means for Charging Storage Battery Cells. Charles W. Bell, Philadelphia, Pa., assignor to The Electric Storage Battery Co., Philadelphia, Pa., a corporation of New Jersey. Filed August 19, 1910. Serial No. 578,025.

1,023,546—Internal Combustion Engine. Madison F. Bates, Lansing, Mich. Filed June 27, 1910. Serial No. 569,010.

1,023,552—Dual Ignition System. Richard H. Cunningham, New York, N. Y. Filed January 29, 1910. Serial No. 540,781.

1,023,553—Change-Speed Gearing. Paul Daimler, Cannstatt, Germany, assignor to Daimler Motoren Gesellschaft, Stuttgart, Germany. Filed June 13, 1911. Serial No. 632,882.

1,023,598—Vehicle Wheel. Louis K. Stephens, Dallas, Texas. Filed February 20, 1911. Serial No. 609,644.

1,023,666—Cover for Pneumatic Tires. Lucien Liais, Paris, France. Filed September 21, 1910. Serial No. 583,052.

1,023,682—Emergency Brake. William Ray Reno, Louisville, Ky. Filed February 16, 1911. Serial No. 608,930.

1,023,683—Transmission Gearing. Frederick Henry Royce, Derby, Eng. Filed October 27, 1911. Serial No. 657,155.

1,023,712—Tire for Vehicle Wheels. John Balazs, Michel, B. C. Can., assignor of one-fourth to Anoka Mihalj, one-fourth to Mandi Balino and one-fourth to G. Heinkel, Michel, Can. Filed June 17, 1911. Serial No. 633,661.

1,023,727—Vulcanizer. Cullen C. Evans, Minneapolis, Minn. Filed January 22, 1907. Serial No. 353,552.

1,023,728—Pneumatic Tube for Vehicle and Other Wheels. Carroll D. Galvin, Merchantville, N. J., assignor of one-sixth to Charles Jacobson, one-sixth to Eugene S. Cochrane, and one-sixth to Amandus F. Jores, Washington, D. C. Original application filed December 6, 1911. Serial No. 664,139. Divided and this application filed January 17, 1912. Serial No. 671,734.

1,023,743—Electric Signaling Device. Adam Lungen, New York, assignor to Edwards & Co., Inc., New York, a corporation of New York. Filed September 24, 1910. Serial No. 583,570.

1,023,751—Retainer for Ball Bearings. Henning Adolf Olsson and Sven Gustaf Wingquist, Gottenborg, Sweden, assignors to Aktiebolaget Svenska Kullagerfabriken, Gottenborg, Sweden, a corporation of Sweden. Filed March 18, 1911. Serial No. 615,340.

1,023,770—Spring Tire. Emanuel Stelmle, Salt Lake City, Utah. Filed June 1, 1911. Serial No. 620,605.

1,023,779—Vehicle Tire. Sherman T. Allen, Detroit, Mich., assignor to Triplex Tire Co., Detroit, Mich., a corporation. Filed April 10, 1911. Serial No. 619,992.

**M**OTOR Car Engine-Starter—No. 1, 1,023,212, dated April 16; to Charles W. Mallins, Liverpool, England. As shown in Fig. 3, this patent applies to a means of cranking the engine of a motor car from the operator's seat by pulling on a handle

H arranged at the side of the dash. The handle at the side of the dash has a cable attached to it, which communicates with a pulley on the starting shaft. When the handle is pulled, the starting shaft is moved into engagement with the forward

end of the motor crankshaft, and then the pulley revolves and turns the crankshaft. A disengageable coupling is provided between the starting-shaft and the crankshaft of the motor, whereby the starting shaft is adapted to transmit rotation in

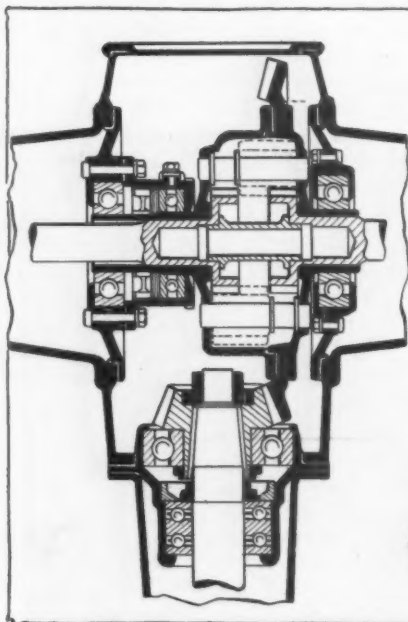


FIG. 1—BEVEL GEAR AND DIFFERENTIAL MECHANISM PATENTED BY ROYCE

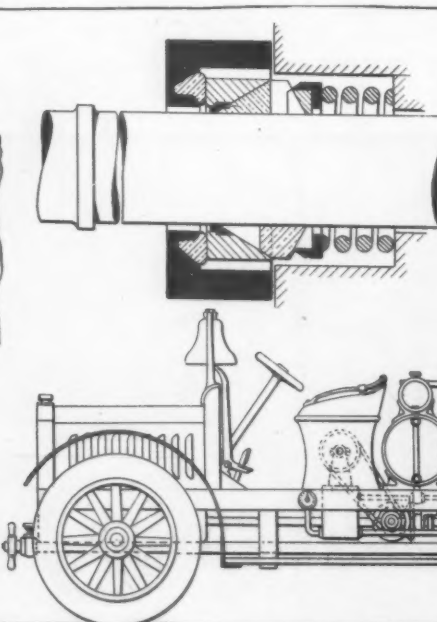


FIG. 2—THE WISCH PACKING

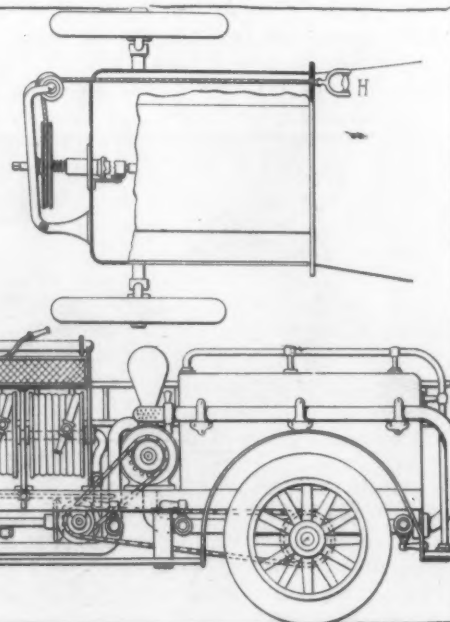


FIG. 3—MALLINS ENGINE STARTER  
FIG. 4—THE EISENBISE FIRE-FIGHTING APPARATUS



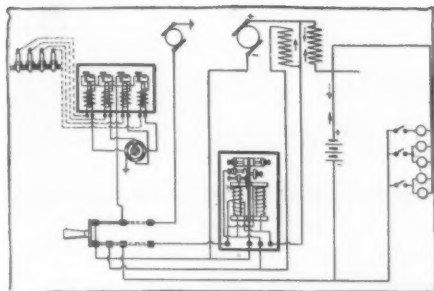


FIG. 5—LIGHTING AND STARTING SYSTEM

one direction only; this is to prevent back kicks. A spring also is provided to urge the starting shaft axially out of engagement with the engine shaft. The arrangement as outlined in the patent and as illustrated in Fig. 3, contemplates mounting the idler pulley for the strap on a movable arm in front of the radiator.

**Wisch Metal Packing Ring**—No. 1,023,189, dated April 16; to Ernst Wisch, Milwaukee, Wis.—This patent relates to a metal packing such as might be employed to advantage on shafts of the engine and transmission mechanism of the motor car. As shown in Fig. 2, it comprises an inner and outer packing ring, each formed from sectors having oppositely-inclined angular outer faces and inner flat faces in tongue and groove engagement. The ends of the sectors of the inner ring are spaced apart to form radially-disposed contractible recesses in conjunction with the flat faces of the outer ring. The female retaining rings have angular faces for engagement with the angular faces of the packing rings, and radial ribs extend from the angular face of one of the retaining rings for interlocked loose engagement with the spaced ends of the inner packing ring against which it impinges.

**Electric Lighting and Starting System**—No. 1,023,122, dated April 16; to Charles E. Bonine, Philadelphia, Pa.—This patent pertains to an electric lighting and engine-starting system for motor cars etc., which as indicated in the wiring diagram, Fig. 5, is a combination of an engine, a shunt and series-wound electric machine connected thereto, a storage battery in the series circuit, and lamps and loads connected in multiple with the battery. The series circuit is opposed to the shunt circuit so as to limit the charging current when the engine is driving the electric machine at high speed, and it operates in conjunction with the shunt circuit to increase the torque of the electric machine when it is operating as a motor. An automatic switch is provided for controlling the charge of the battery by the electric machine; and there is a manually operated switch for cutting out the automatic switch, and connecting the battery to the electric machine so that it may be operated as a motor for starting the engine. This is the latest of the numerous wiring designs for connecting a combined motor generator to supply current for lights and starting and act as a motor for the latter.

## Is Trump Card for Texas Motor Car Plays Important Part In Real Estate Sales In South

IT is probable that in the years to come the motor car will be given due credit and recognition for the important part it has played in the settling up of the ranch region of Texas and the southwest and the converting of wild lands into productive farms. It is a notable fact that but for the convenience afforded by the motor car in getting around the country rapidly there would be at this time very little agricultural development in the former exclusive ranch territory, except, perhaps, close to the lines of railway. Motor cars now are one of the principal and most valuable adjuncts of the land business. This is particularly true of Texas, where there are vast tracts of ranch lands being divided into farms and sold to home-seekers. Much of this acreage is situated 25 to 50 miles from a railroad and it is only by using the motor car that prospective buyers can be shown over the respective properties to advantage.

One of the things that impresses a visitor to a new town in the region that is now undergoing wonderful agricultural development is the large number of cars to be seen upon the streets. Every up-to-date land agent owns two or more and usually they are kept in almost constant use. Several kinds and types of cars are used for the purpose of showing visitors over the lands. In some places large sight-seeing cars are employed for this purpose.

During the fall and winter months when the railroads leading to Texas make a practice of running home-seeker excursions into these portions of the state where the work of colonization is going on, the rush of visitors into the little towns is so great that the land men would not be able to handle them in anything like a satisfactory manner if the motor car was not available as a means of rapid transportation to and from the properties that are being offered for sale.

An important and direct effect of the general use of the motor car in the region that is being converted into farms is the necessity and demand for good roads which its use has created. Many of the new settlers own cars and the promoters of colonization enterprises have found it greatly to their advantage from a financial standpoint as well as a big feature of convenience and satisfaction to the buyers of land to construct splendid roads through the tracts of land before placing them upon the market. One concern in South Texas that has disposed of a tract of about 40,000 acres of ranch land to farmers during the last 12 months constructed more than 200 miles of motor roads through the property inviting prospective buyers to inspect it. When a home-seeker arrived at the new town that was laid out upon the tract he was placed in a car and whisked over the good roads and was enabled to spy out the land in

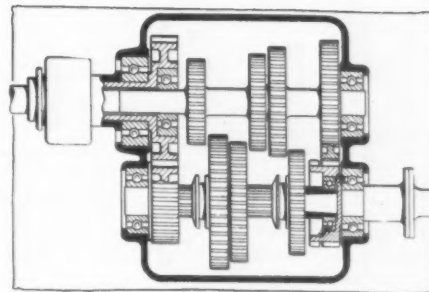


FIG. 6—DAIMLER CHANGE-SPEED GEAR

perfect comfort. The good roads and motor treatment proved valuable factors in making quick sales of the subdivided tract.

## RUSH LOUISIANA ROAD WORK

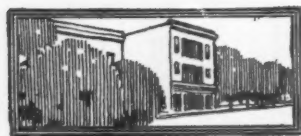
New Orleans, La., April 20.—One year is the time set by President Milner, of the Louisiana Motor League, for the completion of the New Orleans-Mobile highway. At the annual meeting of the league Monday it was decided that the principal activity of the league during the coming year was to be devoted to the Mobile road. The engineer's report showed that the highway would cost \$5,000 per average mile for the 110 miles which must be constructed or repaired. The first 30 miles of the route will lay over the superb shell road to Chef Menteur, which was built by the league. No expenditure will be necessary on this section. The heaviest expense will come with the construction of the 30 miles separating Chef Menteur and the Mississippi line, which is sea marsh at present impassable. Beyond the Mississippi line, all the distance to Mobile, roads already are in existence. Portions of this road will have to be improved considerably but other sections already are maintained in excellent condition.

The league as an organization will work for subsidies from the authorities through whose territory the road is being built. In addition it will assist the project financially. Permission has been secured from the governor to use all available convicts.

Officers of the league for the coming year were elected as follows: P. M. Milner, president; Alfred Aschaffenburg, secretary; Jules M. Burguières, treasurer; C. H. Ellis, first vice-president; John Dibert, second vice-president.

## WISCONSIN'S BANNER COUNTY

Baraboo, Wis., April 20—Sauk County, Wis., for several years the premier road-building county in the Badger state, in the days when there was no state aid for highway improvement and only natural incentives for promoting good roads work, leads the state this year in the gross sum to be expended in this work. Outside of Milwaukee county, Sauk will spend the largest sum, \$45,000, and one of its townships, Delton, will spend the comparatively large sum of \$16,000. The famous Dells of the Wisconsin river, a spot of scenic grandeur, is located in this county and the city residents as well as farmers long ago began to realize the value of good roads.



# Among the Makers and Dealers



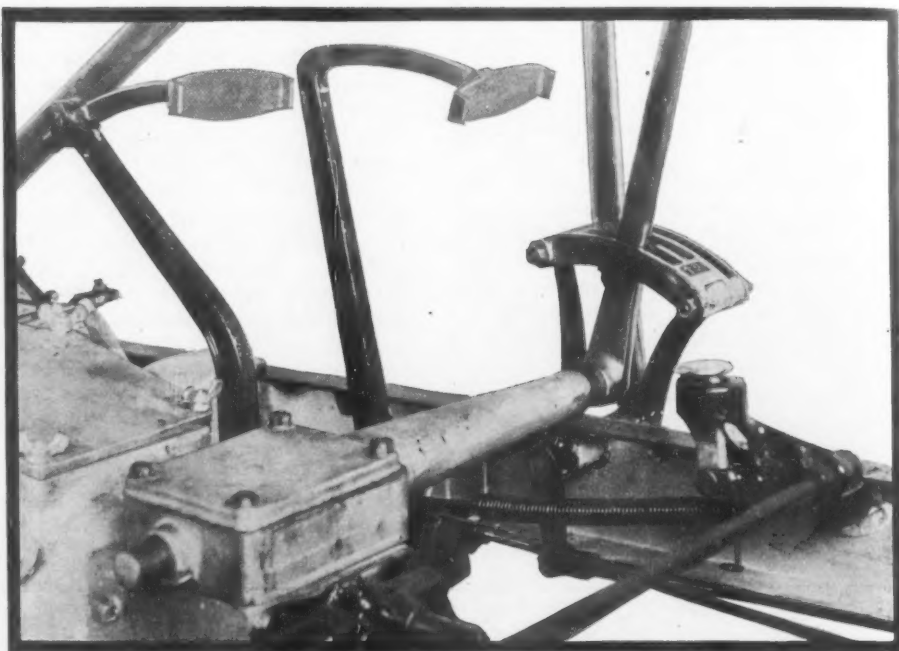
**DEATH of Iowa Dealer**—Ed Glatfelty, secretary-treasurer of the Fairfield Auto Co., Fairfield, Ia., died April 16 after a short illness.

**Randall-Faichney Building**—The Randall-Faichney Co. will occupy the larger portion of the new concrete factory building that is being erected on Atherton street, West Roxbury, Mass., which is to be four stories and basement, 60 by 250 feet, giving 67,000 square feet of floor space.

**New Commercial Car Venture**—The Filer & Stowell Co., of Milwaukee, which owns the Beaver Motor Co., Petrel Motor Car Co. and other important interests, is now devoting its big auxiliary plant at First and Oklahoma avenues, at the southern city limits of Milwaukee, to the production of the F-S light delivery car. The production is going on under the name of the F-S Motors Co.

**Avery in New Deal**—The Acetrol Co., of Milwaukee, has been formed by P. C. Avery, of Milwaukee, and other interests to market an invention by Mr. Avery of a chemical compound to enrich gasoline. The Milwaukee headquarters are at 355 Jackson street. Mr. Avery is chief owner of the Avery Portable Lighting Co., which formerly produced the Auto-Gas tank and later the Electrobola motor lamps. Acetrol, which is the name of the new compound, is claimed to enrich the poorest grades of gasoline at a minimum of cost.

**Oakland's New Gearshift Box**—An accompanying illustration shows the gear-shifting box used in connection with the 1912 Oakland unit power plants which are suspended on three points in the main frame; one point in front and two in the rear, opposite the flywheel housing. The front one is oscillating. Both rear points are bolted to the side channels of the main frame. The control is through an ordinary type of gate and the gear-shifting box itself is mounted on the unit power plant by four studs. The mounting of the gate is cause for comment inasmuch as it is riveted directly to the frame channel, whereas the shaft and lever for shifting the gears are both carried directly by the gear box itself. There also is an entirely different center for actuating the emergency brake rod; therefore, when three-point suspension is in action there cannot occur binding in the gear-shifting arrangement, even if the emergency brake is pulled on to the limit of its travel, it is claimed. The service brake pedals which, in unit power plant constructions, are usually mounted on the clutch rocker shaft, are in this case mounted directly on an independent



OAKLAND'S NEW GEARSHIFT BOX

bracket on the right-hand side channel of the frame, so to prevent any binding on this mechanism.

**Death of Michigan Tradesman**—Charles L. Chamberlain, secretary and general manager of the Muskegon Motor Specialties Co., of Muskegon, Mich., is dead after a long illness. Mr. Chamberlain, who was 30 years old, also was deputy collector of customs and president of the Lange, Chamberlain & Winters Co.

**Helps Real Estate Values**—As indicative of the rise in value of North Broad street property in Philadelphia, due to the increasing demand for sites by motor concerns, 207-209 North Broad street were recently sold for upward of \$150,000. This is more than double the figure brought 2 years ago. The commercial building now occupying the site is leased for a long term by the Goodyear Tire and Rubber Co.

**Stockholder Protests**—Fred H. Yeomans, of Detroit, who claims to own 4,107 shares of the capital stock of the Monroe Body Co., of Pontiac, Mich., has petitioned the circuit court for a mandamus to compel John Parker, secretary and general manager of the company, to allow him to make an examination of the books of the company. Judge Smith has signed an order requiring Parker to show cause on April 29 why he should not allow Yeomans to inspect the books. In his petition Yeomans alleged that although the fiscal year of the company closed August 1, 1911, no financial statement for that year has been issued and no annual meeting of the stockholders has been held.

He also charges that no dividends have been paid in the last year. His stock, he says, is worth \$41,700.

**Hartford's New Garage Rates**—Six of the leading motor dealers of Hartford, Conn., have adopted a new schedule for the garaging of cars that will go into effect on May 1. The price per month for the care of all open cars of 112-inch wheelbase or under will be \$15. For cars over that length it will be \$20. For limousines, landaulets, etc., the price will be \$25.

**Preparing for Merger**—Definite steps toward the organization of the Henderson Motor Car Co., which will manufacture a line of gasoline cars by the opening of an office at 816 Board of Trade building, Indianapolis, by R. P. Henderson. Associated with Mr. Henderson will be L. Carter, of Jessup, Ga., and P. E. Rogers, of Indianapolis. Mr. Carter is president of the Henderson Motor Sales Co., which on July 1 will be merged with the Cole Motor Car Co.

**Stearns Business Increasing**—Says Roy F. York, vice-president of the F. B. Stearns Co. relative to the outlook: "Our business so far is approximately 100 per cent over last season. This means that our branches and dealers are doing from 150 to 200 per cent more business. I find that practically all the companies building cars of standard quality are reporting good conservative increases over previous seasons. Our sales supervisors who are in close touch with trade conditions all over the United States believe that prac-



tically all the companies manufacturing cars of the better quality are having splendid seasons."

**To Make Motor Trunks**—The Continental Trunk Mfg. Co., of Superior, Wis., has been organized with \$50,000 capital to manufacture trunks and bags of all kinds. The company intends to make a feature of trunks and carrying cases for motor cars.

**Organize at Fond du Lac**—The Fond du Lac Automobile Dealers' Association, of Fond du Lac, Wis., has been organized with E. W. Clark as president; R. H. Lee, vice-president; Edward G. Mitchell, secretary, and W. C. Reinig, treasurer. The association plans to conduct an annual show in addition to giving attention to problems confronting dealers.

**Chase Company Increases Stock**—The Chase Motor Truck Co., of Syracuse, N. Y., has doubled its capital from \$150,000 to \$300,000 to increase manufacturing facilities. Plans for an outlay of \$150,000 in improvements and extensions of the plant are being worked out, including the enlargement of the concern's present buildings in South West street. An addition to the plant was built in Wyoming street and completed the first of the year, but it is not ample enough to care for increased business. The directors are as yet undecided regarding the selection of sites for the necessary factory additions.

**Making Many Spark Plugs**—Ten million spark plugs a year will be the capacity of the Jeffery-Dewitt Co.'s new plant at Detroit when additions now in progress of construction are completed. The new addition to the J-D plant will be devoted exclusively to potteries where the porcelain for spark plugs are made from clays and other ingredients imported by that firm from Europe. The new addition will be of brick, 100 by 40 feet, and will be completed within 30 days. The Jeffery-Dewitt's output of porcelains for spark plugs will then be 36,000 a day or a yearly capacity, without crowding the factory, of 10,800,000. One reason for enlarging its plant lies in the fact that the Jeffery-Dewitt Co. has just secured all the patents and rights to manufacture and

sell the Visible spark plug. The new product will be known as the J. D. Visible spark plug.

**Duplex Receiver Appointed**—Circuit Judge Smith, of Charlotte, Mich., has granted the motion of the complainants in the Duplex Power Car Co. case for a receiver, appointing Frank P. Town to that position.

**Jewell With R. C. H.**—W. S. Jewell has joined the forces of the R. C. H. Corporation with the title of eastern sales manager, with headquarters at New York branch, 1989 Broadway. The creation of the new position in the R. C. H. organization was made necessary by the rapid development of the company's business in the eastern section of the country.

**Pittsfield Coil Election**—At a meeting of the Pittsfield Spark Coil Co., in Dalton, Mass., it was voted to increase the capital stock from \$100,000 to \$250,000. Officers were elected as follows: William P. Wood, president; Louis B. Hopkins, treasurer, and with these Zenas Crane and Michael Casey constitute the board of directors. The increase of capital was for the purpose of installing new machinery, purchasing larger quantities of material and engaging a larger working force. The company will continue to make coils, switches, timers, Jewell spark plugs, etc.

**More Franklin Buildings**—The H. H. Franklin Mfg. Co., of Syracuse, has broken ground for the first of two large buildings, which will represent an investment of about \$50,000. The site is in Gifford street. It is stated by President H. H. Franklin, now absent on a trip to the Pacific coast, that the building will be duplicated next year. The building is to be 200 by 150 feet with 30,000 square feet of floor space. The building to be erected later will be alongside the one in question, ultimately giving the company a frontage of 400 feet on Gifford street. The other plants are on South Geddes and Marcellus streets. Both buildings will be of steel and brick and fireproof. They will accommodate a repair shop, blacksmith shop, the first chassis-testing room and a repair shop; also for storage of sundries. There will also be

extra space for manufacturing purposes, to be used as needed. A large increase in output will result. The company now employs 1,300 men. Some departments are working till 9 o'clock at night. Sales thus far show 40 per cent advance over those of last year.

**Elmer Selects Aids**—H. H. Elmer, general manager of the Grant-Lees Machine Co., of Cleveland, which is putting out the Grant six, has for chief engineer Charles E. Lohr, formerly with Haynes; Herbert H. Murden is general superintendent; James S. Worthington, chief draftsman and assistant engineer, and E. L. Lawrence, mechanical engineer. A modern plant is already under erection. The main building will be 100 by 400 feet, of reinforced concrete and steel construction and a similar structure, 60 by 160 feet in size, will complete the plant of the company.

**Expanding Engine Plant**—The Wisconsin Motor Mfg. Co., of Milwaukee, will this year build an addition which will practically double its capacity. The plant has been working night and day for several months and its orders ahead for 1913 and 1914 delivery are so heavy that more floor space is imperative. The present plant was finished only about 18 months ago. Last week 150 mechanics went on a strike because of a change in the premium system, but now are back at work. The strike caused no inconvenience, as it affected departments which the short interruption did not retard.

**Dixon Company Meeting**—At the annual meeting of the stockholders of the Joseph Dixon Crucible Co. in Jersey City, N. J., the retiring board of directors, consisting of George T. Smith, William Murray, Edward L. Young, William H. Corbin, George E. Long, William G. Bumsted and Harry Dailey, was unanimously re-elected. Officers elected for the ensuing year are as follows: President, George T. Smith; vice-president, W. H. Corbin; treasurer, George E. Long; secretary, Harry Dailey; assistant treasurer and assistant secretary, J. H. Schermerhorn. There were voted 9,304 shares of stock out of a grand total of 10,000.



WHERE GENERAL MOTORS TRUCKS ARE BUILT AT PONTIAC, MICH.

# Development Briefs

New Flexible Substitute for Glass Produced in France  
—Prest-O-Lite Welding Outfit for Repair Shops—  
Crane Made of Steel for Garages—Connecticut Timer

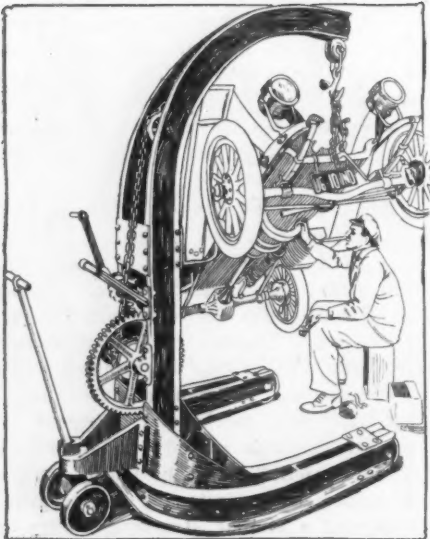


FIG. 1—ONE USE OF PORTABLE CRANE

## Flexible Glass French Invention

**A** MATERIAL has been invented and placed on the French market which it is believed will replace celluloid for side curtains and rear panels of cape car hoods. It is known as flexible glass, and though it has most of the characteristics of celluloid it is almost as transparent as the best glass. In view of the enormous saving in weight, there appears to be no reason why flexible glass should not be used for the windows of closed cars and for windshields. In considering the possible saving of weight, it is of course necessary to bear in mind that not only can the weight of the glass be abolished but the heavy frames and fittings at present employed can be replaced by much lighter material. It is the intention of its inventors to specialize in its use for all purposes where glass is now employed. This flexible glass can be produced commercially at but a slightly higher cost than sheet celluloid, but unlike this latter material it will not blaze. If a naked flame is applied to it, it will melt, but it will not burst into flames. The material is produced in varying thicknesses, and in widths up to about 24 inches.

## Prest-O-Welder

One of the latest products of the Prest-O-Lite Co., Indianapolis, is the oxy-acetylene welding outfit illustrated in Fig. 4. This consists of a combination of an acetylene storage tank similar to but built on a larger scale than the lighting tanks. There is also a tank containing oxygen under pressure. The two tanks with the gauges and connection as well as tubing and an assortment of burners are mounted on a two-wheeled truck which can be drawn to any part of the shop. The heat is generated by the combustion of acetylene gas and oxygen and its intensity is said to be more than double that required to fuse commercial metals. The concentration and intensity of the heat—claimed to be 6,300 degrees Fahrenheit—allows the recasting of metal at points to be joined, nor is the recast metal al-

tered chemically. This makes the process well adapted for rapid and economical repairs of broken metal parts of cars.

## Portable Steel Garage Crane

One of the latest features of garage and repair shop equipment is the portable steel garage crane manufactured by Lafayette Engineering Co., Lafayette, Ind. One of its uses is illustrated in Fig. 1. A steel crane is a practical labor-saving device, for one man can do anything necessary with a car without help. Such an apparatus eliminates the necessity of crawling under a machine, for instead, either end, any part, or the whole machine can be lifted so that the under portion can be easily reached. The portable steel crane is over 8 feet in height, so that a sufficient range of action is obtained. The supports run between the wheels either in front or at the rear of the car and will go under an axle 8 inches from the floor. The crane has  $3\frac{1}{2}$  feet of overhang and consequently can handle any motor car body. The wheels are mounted on roller bearings and the lifting winch is provided with two locks so that it is impossible for it to let loose. The lifting chain is said to be tested for 3 tons weight.

## Connecticut Igniter

A recent type of igniter designed to be operated from the camshaft as any ordinary timer or high-tension distributor is made by the Connecticut Telephone and Electric Co., Meriden, Conn. The appearance of the igniter is illustrated in Fig. 3. The breaker mechanism of the igniter is simple. It consists of a light steel lever pivoted

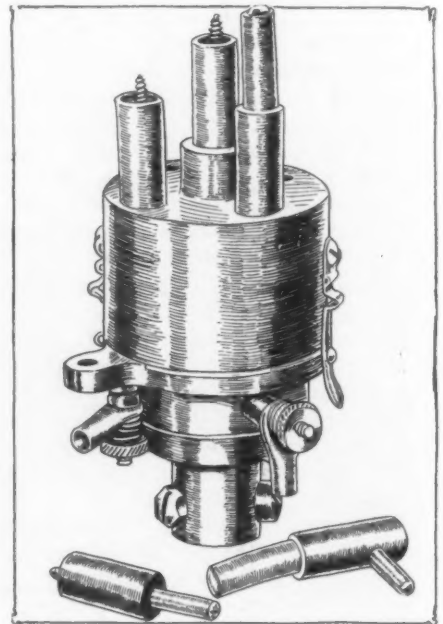


FIG. 3—CONNECTICUT TIMER

upon a steel stud, a bone fiber roller, bearing against the cams, and a large platinum-iridium contact held against a contact screw of the same material by a steel spring. The contact screw is insulated by a brass-face fiber block and is arranged to be adjustable from the outside after the circular bronze ring is slid aside to uncover the housing of the screw. The ring also covers the block through which a small file may be inserted to brighten up the contact surfaces. The cams which actuate the circuit-breaker strike the roller of the

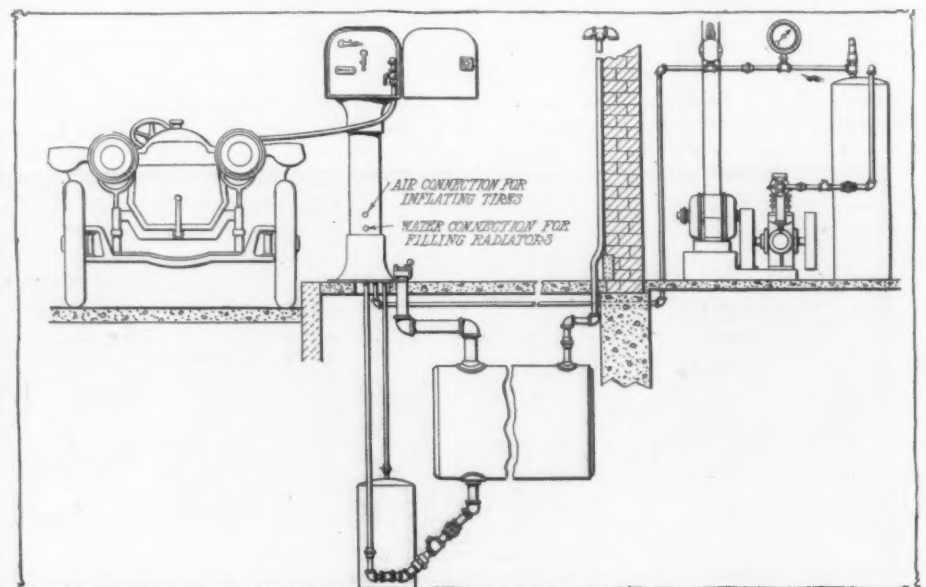


FIG. 2—GEYSER GASOLINE AND OIL STORAGE SYSTEM



# Novelties for Motoring

Latest Accessories for Motorist and Repairman—Device for Operating Gearset and Clutch by Gas Pressure—Geyser Supply Station for Storage of Gasoline

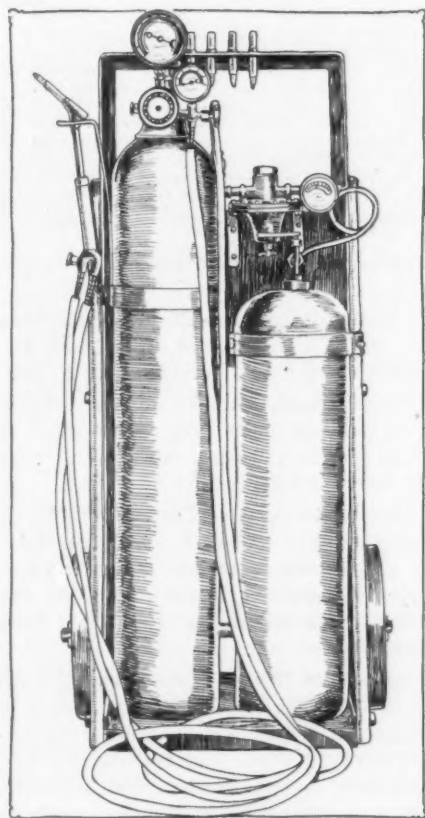


FIG. 4—PREST-O-WELDER OUTFIT

breaker-arm in succession, making and breaking the circuit to the cylinders successively. The distributor arm is fastened to the shaft by a sliding key. Carbon brushes form the contact with the distributor blocks and the terminal of the

secondary coil. Molded into the cap forming the upper part of the apparatus are bronze contact blocks provided with terminals for connecting the spark plugs and transformer coil. The coil which forms part of the circuit is designed to be mounted under the bonnet and is made to withstand a high degree of heat.

## Geyser Supply Station

A unique gasoline and oil storage system has been produced by the Geyser Co., Fort Wayne, Ind. As the illustration Fig. 2 shows, the feature of the system is the curbstone supply for passing traffic. Both oil and gasoline can be obtained at the curb and there is also provided connection in the post with air for tire inflation and water for filling the radiator. Both oil and gasoline are kept in underground storage tanks, which in the illustration are shown under the sidewalk, or they may be placed in the basement. Fuel and oil are forced to the required level by means of air pressure maintained by motor-driven compressor.

## Sheppard Radiators

Radiators of novel construction are manufactured by the Sheppard Co., Chicago. The construction is illustrated in Fig. 6. The front sectional view at the upper left-hand corner shows the straight water tubes  $\frac{1}{4}$ -inch wide through which the water flows directly from top to bottom. In one side of each water tube there is a corrugation as shown at the bottom which is a horizontal section through the radiator. This corrugation extends the full length of these water tubes and its purpose is to allow the tube when frozen to expand without burst-

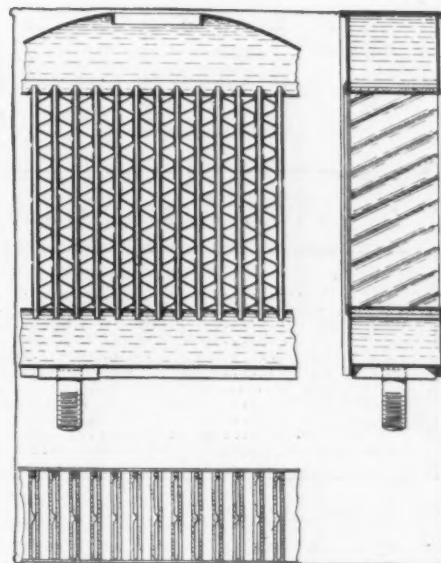


FIG. 6—THREE VIEWS OF SHEPPARD RADIATOR

ing. There is no seam on the front end of the water tube. The seams are on the rear edges and they are double locked and sweated to prevent leakage. At the right is shown a vertical section through the radiator illustrating the Sheppard principle of inclining the air spaces upward from front to rear at an angle of 30 degrees. This is believed to force the cooling air to come in greater frictional contact with the radiating surfaces and permit the heat to be more rapidly removed from the water than when the air is drawn through a horizontal air space. It is claimed that in cars not equipped with fans the radiators create a natural draft, because as the air becomes heated in the air spaces it will naturally rise up the inclined spaces and clear from the highest point on the same principle as the draft from a chimney.

## Gas-Pressure Gearset

Allen M. Irish, a marine engineer, of Bath, Me., has developed a gearshift which is controlled through fluid pressure and which has several commendable features. The arrangement is illustrated in Fig. 5 and the method consists in storing up the cylinder gas under explosion pressure through a check valve on one cylinder, this in turn operating plungers on the gearbox so that the gears are shifted by the pistons. The gas pressure is used also to engage and disengage the clutch. The entire clutch and gearset control is by means of a lever on the steering post. It is but necessary to elevate the outer end of the operating lever, which releases the clutch, then swing the lever a few degrees, which shifts the gears. It should be observed that this operating lever simply actuates the valve controlling the pressure fluid and that the real force, acting upon the clutch and gears, is exerted through the plungers, which are actuated by pressure, thus rendering it possible to disengage the clutch, shift the gears and re-engage the clutch with the use of but one finger.

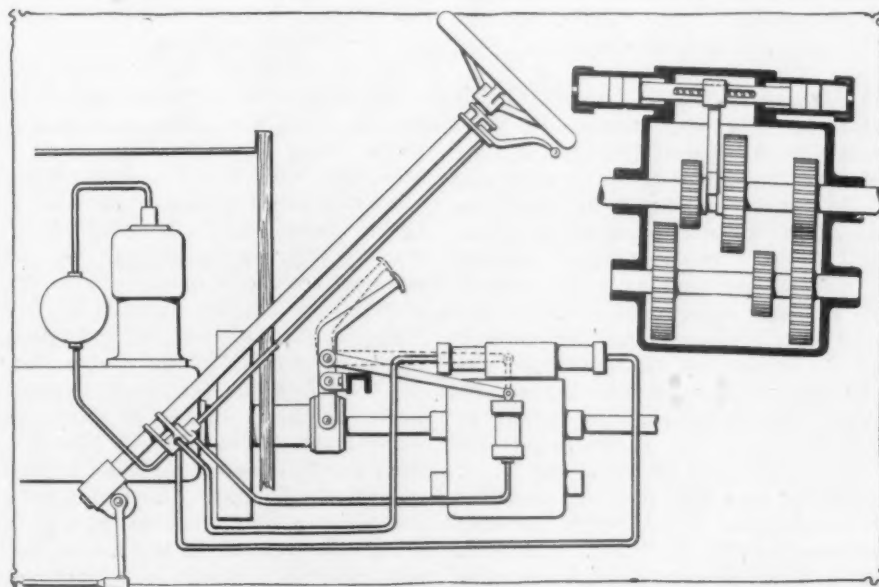


FIG. 5—IRISH FLUID-PRESSURE GEARSET MECHANISM



# Brief Business Announcements

## New Agencies Appointed by Pleasure Car Manufacturers

Town	Agent	Make of Car	Town	Agent	Make of Car
Athens, O.	F. L. Preston	Cole	Muncie, Ind.	E. McMullen	Cole
Canton, Ill.	Meade McClatchy	Cole	Nashville, Tenn.	B. S. Patterson	Marmon
Charlotte, Ia.	Charlotte Auto Co.	Cole	New Orleans, La.	Fairchild Auto Co.	Cole
Charlotte, N. C.	Mecklenburg Auto Co.	Franklin	Newport, Ky.	Fox Automobile Co.	Franklin
Columbus, O.	Ira N. Thompson	Inter-State	San Diego, Cal.	Frank Flesner	Westcott
Columbus, O.	Alec F. Bernhard	King	Toledo, O.	American Motor Sales Co.	Case
Davenport, Ia.	American Auto Co.	American	York, Pa.	A. S. Bubb	Maxwell
Davenport, Ia.	Schroeder & Pettersen	Metz	Washington, D. C.	Norris and Cowls	Cole
Edgertown, Wis.	C. L. Culton	Cole	West Jefferson, O.	John M. Gillivan	Jackson
Grafton, W. Va.	A. A. Holt	Everitt	Wilmington, N. C.	H. L. Fennel	Marmon
Lake City, Ill.	J. C. Reeter	Cole			

**TORONTO**—The Firestone Tire Co. has opened a Canadian branch in this city.

**Ingersoll, Ont.**—O. C. Beacroft, late of Flint, Mich., will be manager of the new Ingersoll Garage Co., which is about to be opened in Ingersoll.

**Goderich, Ont.**—The Huron Gasoline Engine and Machinery Co. will locate at Goderich to undertake repair and later on manufacture engines, power plants and farm machinery.

**Chelsea, Mass.**—The New York and Boston Auto-Bus Co. has been formed here to handle motor cars. Daniel O. Fillmore is president, Charles E. S. Moir, treasurer, and Lucy M. Fillmore, secretary.

**New Haven, Conn.**—The Howard Co. has just been given permission by Building Inspector Austin to erect a new garage on the boulevard to take the place of the one recently destroyed by fire.

**San Francisco, Cal.**—W. N. Hunt has joined the sales force of the Franklin Automobile Co., of San Francisco. Before going to the Franklin company Mr. Hunt was manager of the San Francisco branch of the Goodyear Tire and Rubber Co.

**Buffalo, N. Y.**—The Oldsmobile Co., of Buffalo, capitalized at \$10,000, has filed a certificate of incorporation. The concern will deal in motor-driven vehicles. The directors are W. J. Mead and R. M. Mosher, of Lansing, Mich., and L. G. Doge, of Buffalo.

**Cincinnati, O.**—The real estate and lines of the Imperial Motor Car Co. on Walnut Hills have become the property of Henry Luhrman. The property bought outright is the garage on Madison road, opposite St. Francis de Sales church, East Walnut Hills, completed only a few months ago at a cost of \$50,000, and the lease of the original garage property on McMillan street, near Peebles Corner. The deal takes in the local agency for the Baker electric and Stearns. Luhrman buys the property for the Cole Motor Sales Co., which recently established an office in the new office building at Peebles corner. The Imperial Motor Car Co. has a capitalization of \$150,000. Harry C. Streuss, who

was largely interested in its affairs, retires.

**Vermontville, Mich.**—Ernest L. Jones has decided to build a garage adjoining his present blacksmith shop.

**Louisville, Ky.**—The Louisville Lozier Co. has acquired the agencies for the Lozier and Pullman cars. Howard Lothrop, of Detroit, Mich., is the manager of the new concern, which has opened temporary quarters at 708-712 West Broadway.

**Akron, O.**—The following salesmen were appointed by the Goodyear Tire and Rubber Co.: George Bullock, Willard E. Parsons, San Francisco branch; G. R. Kreps, motor truck salesman, Philadelphia; M. J. Dobler, city salesman, New York city; Woodson Reese, covering northern Missouri, out of the Kansas City branch; H. B. Annable, Spokane branch; H. C. Falkell, Cincinnati branch. G. G. Woodward, formerly truck salesman at New Orleans, now holds the same position at Memphis, Tenn. The following additions were made during March. F. B. Sullivan and Myron T. Sparks, motor truck salesmen, Boston, Mass.; Frank R. Isaac, motor truck salesman, Philadelphia, Pa.; F. C. Heid, Baltimore; Robert E. Campbell, St. Louis; E. F. Crawley, Jacksonville; J. B. Liner, city salesman, New York. V. D. Lersch, formerly at Cleveland, is now salesman at Buffalo. J. H. Whetstone has been transferred from Buffalo to the Detroit branch, and Glen Schrader, formerly of Indianapolis, is now at the Dayton branch. J. J. Kendall is now at the Charlotte branch, and H. Q. Tennant, formerly special sundries salesman at Atlanta, has been made inspector in the adjusting department. W. E. Dermody is city salesman at New Orleans, and G. T. Hancock has been appointed local branch manager of the recently opened Newark branch, New Jersey. C. E. DeVore and Carl Davidson are missionary salesmen at Cleveland and W. M. Boggs has been appointed city salesman at Philadelphia. P. G. Smith, formerly assistant to C. W. Martin, Jr., at Atlanta, has been transferred to the Akron office to assist Mr. Martin in his new duties as

manager of the motor truck tire department.

**Minneapolis, Minn.**—The Viehman Auto Co., 311 Third street S., has taken the northwestern rights for the Auburn car.

**Grand Island, Neb.**—The Jarvis-Bander Auto Co. has taken over the business of W. E. Rounds and will handle the R. C. H., Oakland and Cutting.

**New Orleans, La.**—Jean H. Duffy, a decorator, has opened a new department in conjunction with his other business, that of repairing motor cars. He has taken over a large building at 820-24 Julia street.

**Milwaukee, Wis.**—The Milwaukee branch of Orrin R. Hughes, Marshfield, Wis., Wisconsin distributor for the Garford pleasure car and truck and the Everitt line, has been moved to the Stroh building, Jackson and Michigan streets. C. L. Leshner is local manager.

**Los Angeles, Cal.**—A. M. Young, formerly manager of the Grundy Motor Car Co., of Los Angeles, has branched out in another line and will handle the Thomas. The concern will be known as the Thomas Motor Car Co. of California. L. A. Pratt will be manager of the sales department and William F. Lloyd will be in charge of the service department.

**Detroit, Mich.**—William C. Little, until recently connected with the General Motor Car Co., Philadelphia, representative of the Lozier Motor Co., has severed his connection with that concern to accept a position with the Detroit offices of the Lozier company in the capacity of western traveling representative. He will represent the Lozier company in the Missouri river and Rocky mountain territory.

**Pittsburgh, Pa.**—The \$60,000 garage and sales building of the White Motor Car Co., now located at 219 South Beatty street, is being erected at Craig and Atherton streets on the old Luna park site. The building will be ready for occupancy early in May. The new home of the company will be two stories high, on a lot 170 by 150. It will be of brick and reinforced concrete, with terra cotta facing and cement floors throughout. It



will contain large salesrooms, offices, display rooms and repair shops.

**Anderson, Ind.**—George B. Pieper has been appointed branch manager of the Boston branch of the Remy Electric Co.

**Minneapolis, Minn.**—J. T. Ranger, distributor for the Nyberg car, will remodel his garage and replace the solid front of the building with plate glass.

**Detroit, Mich.**—W. W. Gregg, formerly with Schlessenger & Sons, of Milwaukee, Wis., has been appointed to the position of manager of works for the Hayes Mfg. Co., of Detroit.

**Milwaukee, Wis.**—The Auto Lamp and Radiator Co., 188 Fifth street, has been appointed distributor of Guide motor lamps. M. E. Kingsley and S. Holny are the owners.

**Washington, D. C.**—Elliott P. Hough has been appointed manager of the Matheson Automobile Co., of Washington. He was formerly secretary of the Automobile Club of Washington.

**Toledo, O.**—The future home of the Stoddard-Dayton in Toledo will be in the old Central Auto Co. building on Ontario street. Walter Hodge is the new distributor of the concern in this territory.

**Seattle, Wash.**—The Motor Distributing Co., Seattle representative for the Lozier, announces its intention of spending \$80,000 for a permanent home for the Lozier in this city. The company has purchased for \$50,000 a piece of property 70 by 130 at Broadway and Pike street and work has been started on a \$30,000 salesroom and garage.

**Louisville, Ky.**—The Younger Auto Co. has secured the agency for the E-M-F and Flanders cars in this territory and has established headquarters on Third avenue, near Breckinridge street. This line was formerly handled by the Glenn-Bauer Motor Co., but this concern will devote its entire attention to the sale of Pierce-Arrow pleasure cars and the Brock electric hereafter. The Studebaker Cor-

poration will continue to maintain its branch office in Louisville.

**Toronto**—The K. & S. Auto Tire Co., 5017 Yonge street, is sole representative for Canada for the Kelly-Springfield tires.

**Toronto**—The Universal Rim Co., of Chicago, has appointed Daniel F. Cole sole Canadian representative for Baker demountable rims. He is at 53 Richmond street East.

**Portland, Ore.**—A. J. Edwards, formerly manager of the Portland branch of the Ford Motor Car Co., has joined the sales force of the Portland branch of the Studebaker Corporation.

**Boston, Mass.**—Harry J. Bayers has become a member of the J. G. Bell firm and the name is now changed to Bell & Bayers. The company handles batteries and supplies at 1074 Boylston street.

**Milwaukee, Wis.**—Howard M. Eldred, distributor for Allen-Bradley charging outfits, Hagstrom products, Gabriel snubbers and many other motoring specialties, has moved to 130 Oneida street.

**Minneapolis, Minn.**—The Glide Automobile Co. has succeeded the Royal Automobile Co. in Minneapolis and will carry the Glide line. J. L. Killion has bought an interest in the company and is president and manager.

**Pittsburgh, Pa.**—John Taylor has organized the Taylor Motor Car Co., with headquarters at 7125-7131 Kelley street, to sell and distribute Lippard-Stewart commercial cars in western Pennsylvania. John Taylor is president; James A. G. Sherer, secretary and treasurer, and H. S. Townsley, manager.

**Philadelphia, Pa.**—The name of the W. Wayne Davis Co., Broad and Green streets, has been changed to the Hunter-James Co., the new concern to continue as distributor of the Everitt for eastern Pennsylvania, southern New Jersey and Delaware. The new company comprises David W. James, formerly assistant sales manager of the Metzger Motor Car Co.,

of Detroit, and S. D. Hunter, formerly identified with the W. Wayne Davis Co.

**Milwaukee, Wis.**—The Ph. Gross Hardware Co., 126-128 Grand avenue, has been appointed local distributor of Federal tires.

**Rochester, N. Y.**—H. E. Sunderland, of the Cutler building, has taken on the King line for this city, including Monroe, Wayne, Livingston and Ontario counties.

**Norwood, Mass.**—The Martin Motor Car Co. is having constructed a large garage that will be ready about September 1 and which will be used as an adjunct to its Franklin garage.

**Chicago**—The Lansden Co., of Newark, N. J., has opened a factory branch at 1000 Michigan avenue. A service department also will be instituted at its branch. C. P. Jaeger will manage the branch. Robert S. Hotz, who is president of the company, will make his residence in Chicago.

**Beaver Dam, Wis.**—The Peshap Garage and Auto Livery Co., South Spring street, now has one of the largest garages in any city of the size of Beaver Dam in the country. A large addition, 50 by 60 feet, has just been completed. The company now represents the Oakland, Kritt and Brush.

**Milwaukee, Wis.**—The Milwaukee Auto Tire and Supply Co., distributor for the Republic Rubber Co., has engaged R. H. Bellman, formerly of the Chicago branch of the United States Tire Co., as manager. The company recently increased its capital and is now rebuilding and enlarging its works and store at 457-459 Milwaukee street.

**Moose Jaw, Sask.**—Manley, Loney & Co., agents for Ford, Reo and Russell cars, have purchased the northwest corner of Main and Athabasca streets. They intend erecting a modern fireproof block covering the entire site, 54 by 125 feet. This building, which will be at present two stories in height, will be so constructed as to carry eight additional stories,

## Agencies Recently Appointed by Commercial Car Manufacturers

Town	Agent	Make of Car	Town	Agent	Make of Car
Albany, N. Y.	McIntyre Auto Sales Co.	McIntyre	Minneapolis, Minn.	Plant Rubber Co.	Kelley
Aurora, Ill.	Wolf & Parker	Monitor	Memphis, Tenn.	F. A. Durmeister	McIntyre
Auburn, N. Y.	E. A. Rose	Kelley	New York	Doull Miller Co.	Kelley
Bakersfield, Cal.	McKee & Scott	McIntyre	Norfolk, Va.	F. S. Sager	Kelley
Beaumont, Tex.	Stedman Fruit Co.	Kelley	New Haven, Conn.	Cowles Tolman	Kelley
Black Oak, Ind.	Henry Ewen	Kelley	Nashville, Tenn.	Imperial Motor Car Co.	McIntyre
Boston, Mass.	Standard Motor Truck Co.	McIntyre	New Berlin, Pa.	H. H. Maurer	McIntyre
Buffalo, N. Y.	Werick Brothers Motor Car Co.	McIntyre	N. Attleboro, Mass.	E. R. Crossley	Sandusky
Butte, Mont.	E. Wiley Hill	McIntyre	Ottawa, O.	H. L. Spalt	Kelley
Chicago	C. E. Swanson	McIntyre	Philadelphia, Pa.	Lovegrove & Co.	McIntyre
Charleston, S. C.	H. L. Koster	Kelley	Peoria, Ill.	Banta Brothers	McIntyre
Connersville, Ind.	George R. Beeson	McIntyre	Reading, Pa.	D. B. Hoffer	Kelley
Council Bluffs, Ia.	Bradley, Herliam & Smith	McIntyre	Rochester, N. Y.	Ball-Washburne Motor Co.	Kelley
Duluth, Minn.	Electric Service and Repair Co.	Adams	Rapid City, S. D.	Thomas Roush	Kelley
Escanaba, Mich.	Delta Hardware, Auto and Sup. Co.	Monitor	South Bend, Ind.	Otis Motor Car Co.	Kelley
Evansville, Ind.	F. W. McNeely & Co.	Kelley	Syracuse, N. Y.	W. R. Shaw	Kelley
East Liverpool, O.	Potter Motor Car Co.	Kelley	Stamford, Conn.	Mechaley Auto Co.	McIntyre
Ft. Worth, Tex.	H. H. Lewis, Jr.	Kelley	Syracuse, N. Y.	Syracuse-McIntyre Co.	McIntyre
Gloversville, N. Y.	J. August Schmidt	McIntyre	St. Louis, Mo.	Kingman Plow Co.	McIntyre
Hartford City, Ind.	Hartford City Auto Co.	McIntyre	Schenectady, N. Y.	J. J. Akor	McIntyre
Hartford, Conn.	McIntyre Commercial Car Co.	McIntyre	South Whitley, Ind.	Owen H. Smith	McIntyre
Hopkinsville, Ky.	Ferd Schmidt	Kelley	Syracuse, N. Y.	W. H. Bissell	International
Huntington, Ind.	Shinkle, Richardson & Co.	McIntyre	Tiffin, O.	R. W. Miller	Kelley
Ithaca, N. Y.	D. F. Head	McIntyre	Union City, Conn.	Union City Auto Co.	Monitor
Jacksonville, Fla.	Jacksonville Machine Works	Kelley	Wheeling, W. Va.	Hearne Motor Car Co.	Kelley
LaCrosse, Wis.	Fox Brothers	McIntyre	Webster, N. Y.	McIntyre Auto Sales Co.	McIntyre
Little Falls, N. Y.	F. B. Austin	McIntyre			

will, as soon as completed, be the home of the motor car business of this firm.

**Kokomo, Ind.**—C. E. Stolte, former traffic manager for R. M. Owen & Co. at Lansing, Mich., has joined the sales force of the Apperson Brothers Automobile Co.

**Chicago**—Charles E. Hagmann, Hoyne avenue and Jackson boulevard, agent for the Lambert, is adding to his garage. When completed he will have a two-story building, 70 by 128 feet.

**Pittsburgh, Pa.**—The garage, repair shops and storage rooms of the Oakland Auto Co., 3415 and 3417 Forbes street, which were burned some time ago with a loss of \$40,000 to machines and building, is being remodeled.

**Washington, D. C.**—The Motor Truck Corporation has been formed to handle the Alco and Little Giant trucks. It has secured a salesroom at 1319 H street, N. W. The company may add Alco pleasure cars later in the season.

**Boston, Mass.**—The Whitney-Barney Co., 823 Boylston street, has been appointed distributor for Lippard-Stewart commercial cars in Massachusetts, New Hampshire and Vermont. It has a service station 100 by 120 feet on Charles River road, Cambridge, Mass., and a showroom at 823 Boylston street, Boston.

**Washington, D. C.**—Harold N. DeWitt has been appointed receiver of the Pope Automobile Co., agent for the Pope-Hartford, Marathon and Columbus electric. His bond was fixed at \$10,000. The equity court has issued a rule, returnable May 22, calling on the company to show cause why the application of John H. Nolan, the principal stockholder, for the dissolu-

tion of the company should not be granted.

**Minneapolis, Minn.**—F. S. Johnson has been appointed northwestern sales manager for the Federal Rubber Mfg. Co., which will establish a branch in Minneapolis.

**Toledo, O.**—Jamieson Brothers have secured the agency for the Oldsmobile in northwestern Ohio. The concern is composed of Lee D. and Burton L. Jamieson. A new brick building will be erected on Huron street.

**Philadelphia, Pa.**—The first floor and basement of 1927-1929 Market street have been leased to the Moon Motor Car Co., of Philadelphia, which will occupy the site after extensive repairs and alterations have been completed.

**San Francisco, Cal.**—The Baker electric has been secured by the Standard Motor Car Co. The Standard already had the agency in southern California, but under its new contract it has secured it for the whole of the state of California.

**Toronto**—Death & Watson, Ltd., electrical engineers, are planning to open a new garage building on Huntley street near the Huntley street bridge leading into Rosedale. All classes of cars will be received, but it is the intention to specialize with the electrics.

**Chicago**—Fred J. Urban has been made special representative for the Remy Electric Co. in the middle west, covering the Chicago and Detroit territory, with headquarters at the Chicago branch. Gerald Fitzgerald has been transferred from the Detroit branch to the sales force of the Chicago branch and A. C. Hyser is now

connected with the Detroit branch of the Remy Electric Co.

**Holland, Mich.**—The City garage will be enlarged to accommodate increasing business. Frank White has been taken into the firm, which formerly comprised C. J. Lokker and H. Prins.

**Muskegon, Mich.**—R. A. Weinhardt, formerly mechanical engineer for the Henry Motor Car Co., has severed his connections with that concern and now is connected with the Continental Motor Mfg. Co., of Muskegon.

**Anderson, Ind.**—The Remy Electric Co. has established two new service stations. The service station in Atlanta, Ga., will be in charge of the Alexander-Seewald Co. and the Electric Sales Co. will have the Savannah, Ga., station.

**Louisville, Ky.**—The Amrol French Air Motor Co., capitalized at \$50,000, has filed articles of incorporation. The incorporators are: Amrol French, W. M. Swearingen and Lawrence Hawkins. The new company will promote a patent.

**New London, Conn.**—C. A. Small, the Cadillac dealer of Norwich, who recently purchased the Holt house at the corner of Main and Church streets, is having the building torn down and in its place will be erected a modern garage.

**Pittsburgh, Pa.**—The work of putting in the foundation for the garage and salesrooms of the Pittsburgh Auto Lamp Repair Co., in Grant boulevard, between Ridge and Bellefield street, has been completed. The company is now quartered in South Beatty street. The structure will be two stories in height on a lot 55 by 52 by 72.

**Albany, N. Y.**—Allen & Arnink Auto Renting Co., capital stock, \$5,000; incorporators, W. G. Allen, H. Arnink, B. H. Arnink.

**Amherst, N. S.**—Nova Scotia Carriage and Motor Car Co., capital stock, \$2,000,000; directors, M. G. Winters, N. Curry, Hector McInness, P. C. Black, W. H. Wentzell.

**Augusta, Me.**—Thirty-five Percent Automobile Supply Co., capital stock, \$1,000; promoters, E. M. Leavitt, M. M. Spinney, E. L. McLean.

**Baltimore, Md.**—Elastic Wheel Co., capital stock, \$1,000,000; to manufacture and deal in motor cars and accessories.

**Bangor, Me.**—Blaisdell Automobile Co., capital stock, \$25,000; to deal in motor cars and supplies; C. R. Blaisdell, president; E. D. Blaisdell, treasurer.

**Buffalo, N. Y.**—Oldsmobile Co. of Buffalo; capital stock, \$10,000; deal in motor cars; incorporators, W. J. Mead, R. N. Mosher, L. G. Dodge.

**Buffalo, N. Y.**—Autoaro Pump Co., capital stock, \$1,000; to manufacture air pumps; incorporators, W. W. Cohen, L. K. Schwartz, M. M. Cohen.

**Boston, Mass.**—United Garage Co., capital stock, \$4,000; incorporators, Jesse Good, James R. Jones, W. F. Waters.

**Brooklyn, N. Y.**—Royal Auto Co., capital stock, \$6,000; incorporators, Harry Baumann, W. Gerdes, A. Levy.

**Canton, O.**—Stark Rubber and Novelty Co., capital stock, \$100,000; to manufacture rubber articles; incorporators, J. J. Lisbae, W. A. Stafford, D. L. Holwick, L. King, W. E. Sherer.

**Chelsea, Mass.**—New York and Boston Auto-Bus Co., capital stock, \$20,000; D. O. Fillmore, president; C. E. S. Moir, treasurer.

**Chicago**—Star Motor Delivery Co., capital stock, \$75,000; conduct general trucking and delivery service; incorporators, J. E. Hau-ronie, F. R. Burt, F. P. Page.

**Chicago**—Byam International Auto Tire Co., capital stock, \$50,000; to manufacture motor car accessories; incorporators, W. W. Byam, E. C. Byam, W. A. Scott.

## Recent Incorporations

**Chicago**—Brazil Tire and Vulcanizing Co., capital stock, \$5,000; incorporators, B. H. Bellman, R. Leseth, E. Lansberg.

**Cleveland, O.**—B. & B. Mfg. Co., capital stock, \$35,000; incorporators, W. E. Smith, R. L. Bacher, W. R. Bauman, L. C. Heinberger, I. T. Quick.

**Cleveland, O.**—City Auto Livery Co., capital stock, \$10,000; to conduct garage; incorporators, W. E. Smith, R. L. Bacher, W. R. Bauman, L. C. Heinberger, I. T. Quick.

**Cleveland, O.**—K. D. Carburetor Co., capital stock, \$5,000; to manufacture carburetors; incorporators, C. A. Riemenschneider, H. C. Gahn, E. L. Fraser, C. W. Shimmion, E. L. Fraser, Jr.

**Cleveland, O.**—Universal Lubricating Co., capital stock, \$100,000; to manufacture lubricants; incorporators, S. W. Scofield, C. B. Emery, C. B. Arthur, T. H. J. Williams, Jr., E. Dreher.

**Cleveland, O.**—State Auto Sales Co., capital stock, \$10,000; to deal in motor cars and supplies; incorporators, Mark B. Mead, George F. Hammond, W. G. Fligie, B. S. Benjamin, R. H. Dorrance.

**Indianapolis, Ind.**—Hampton Mfg. Co., capital stock, \$5,000; to manufacture motor car accessories; incorporators, S. B. Nussbaum, S. Allman and W. Hampton.

**Louisville, Ky.**—Amrol French Air Motor Co., capital stock, \$50,000; incorporators, Amrol French, W. M. Swearingen, Lawrence Hawkins.

**New York**—Motor Vehicle Speed Alarm Co., capital stock, \$500,000; incorporators, H. O. Coughlan, J. F. Curtin.

**New York**—Sullivan Garage Co., capital stock, \$15,000; incorporators, John M. Mac-Alan, P. B. Riley, M. E. MacAdam.

**New York**—Auto Holding Co., capital stock, \$10,000; to deal in motor cars; incorporators, M. O. Russ, H. Edwards, A. Bernstein.

**New York**—D. Macwatty & Co., capital stock, \$5,000; to manufacture lubricants; incorporators, Duncan Macwatty, H. P. Lowe, W. J. Weir.

**New York**—Rubber-Aer Co., capital stock, \$25,000; to manufacture rubber goods; incorporators, Daniel B. Crane, Jr., E. Mavoie, H. M. Smith.

**New York**—Houpert Machine Co., capital stock, \$25,000; general machine and repair shop; incorporators, H. J. Houpert, N. W. Durnin, S. Carusso.

**New York**—Dual Wheel Co., capital stock, \$50,000; to manufacture tires, rubber goods, etc.; incorporators, R. V. Stuart, P. J. O'Connell, H. P. Reader.

**New York**—Motorflex Equipment Co., capital stock, \$150,000; to manufacture devices for motors; incorporators, R. L. Patterson, S. I. Prescott, C. E. Goldsborough.

**Newburgh, N. Y.**—Newburgh Auto Top and Dust Cover Co., capital stock, \$500; incorporators, C. Clapper, R. E. Nixon, E. A. Caren.

**Olympia, Wash.**—Seattle Auto and Freight Co., capital stock, \$10,000.

**Rye, N. Y.**—Motor Mail Transportation Co., capital stock, \$60,000; incorporators, J. J. Cassidy, W. C. Prime, J. L. Crawford.

**San Antonio, Tex.**—Texas Airless Tube Filler Co., capital stock, \$1,000; to manufacture and sell rubberline for tires; incorporators, D. R. Fant, J. A. Mahoney, H. M. Booth.

**Terre Haute, Ind.**—Vigo Mfg. Co., capital stock, \$25,000; to manufacture motor car parts and mechanical devices; incorporators, J. R. Finkelstein, R. G. Jenckes, Jr., L. M. Eyke and W. M. Lewis.

**Utica, N. Y.**—Buick Sales Co., capital stock, \$5,000; deal in motor cars; incorporators, George Beatty, A. B. Beatty, E. L. Beatty.

**Xenia, O.**—Central Garage Co., capital stock, \$5,000; to operate sales agency; incorporators, J. Baldner, G. H. Baldner, C. K. Wolf, A. C. Messenger.



# BUSINESS IS BRISK

**T**HE demand for Stromberg Carburetors this spring is the greatest in the history of our business. The way orders are coming in would indicate that this is surely a Stromberg year.

Discriminating car-owners, about to graduate to something better, in the way of larger or more luxurious cars, are demanding Stromberg Carburetors as part of the equipment on their new machines.

Thousands of car-owners, who are not buying new cars this year, are putting Strombergs on their old cars, increasing the efficiency of their motors thereby, and insuring for themselves some real motoring pleasures from now on.

Wise manufacturers have already learned that Stromberg Carburetors are the most universally satisfactory under all conditions of

climate and weather—that Stromberg Carburetors add value to their cars by giving their users the most pleasure at the least cost—and are now equipping their entire outputs with the Stromberg.

To take care of this wonderful increase in the number of Stromberg users, we are extending our Service System as rapidly as we can, and we feel certain that Stromberg users will be as carefully taken care of this year as they have been in the past.

If you are going to buy a new car this year—demand a Stromberg. If you want a better car than you now have, put a Stromberg on it.

“Stromberg Carburetors are the best because they give the best results.”

## **Stromberg Motor Devices Company**

64-66-68 East 25th Street, Chicago

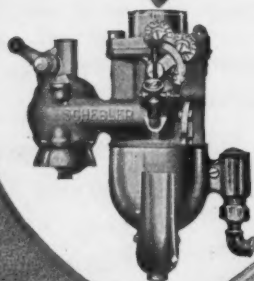
NEW YORK BRANCH, Automobile Building, 1926 Broadway, at 64th Street. BOSTON BRANCH, Motor Mart, 91 Church Street. DETROIT BRANCH, 1211 Woodward Avenue. INDIANAPOLIS BRANCH, 514 North Capitol Avenue. NORTHWESTERN BRANCH, 1514 Hennepin Avenue, Minneapolis. SAN FRANCISCO BRANCH, 307 Golden Gate Avenue.

### DISTRIBUTORS

Auto Supply Co., Baltimore, Md.; Auto Equipment Co., Philadelphia, Pa.; James G. Barclay, Buffalo, N. Y.; Fisk Co. of Texas, San Antonio, Tex.; Dallas, Tex.; Kansas City Auto Supply Co., Kansas City, Mo.; The M & M Company, Cleveland, Ohio; Pittsburgh Auto Equipment Co., Pittsburgh, Pa.; Chanslor & Lyon Motor Supply Co., San Francisco, Los Angeles, Fresno, Portland, Seattle and Spokane; John Millen & Son, Ltd., Montreal, Toronto, Winnipeg, Vancouver; Russell Motor Car Co., Toronto, Montreal, Hamilton, Winnipeg, Calgary, Vancouver, Melbourne, Aust.

# SCHEBLER

*The Aristocrat of Carburetors*



THE HEART OF  
THE AUTOMOBILE

## WHEELER & SCHEBLER

"Pioneers in Perfection" of Carburetion  
MANUFACTURERS • INDIANAPOLIS U.S.A.

*The Schebler is the acknowledged  
standard carburetor of the world*

### BRANCHES

New York • Boston • Atlanta  
Philadelphia • Minneapolis  
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Detroit • Los Angeles • Seattle  
San Francisco • Montreal Can.  
• Sidney Australia •

### Service Department

### Distributors

Every city and town in  
the United States and  
Canada • Europe and  
• Australia •



NUMBER 7 of a series of advertisements dealing with the bulb-horn as a warning device. These include opinions of prominent motorists, non-motorists, legal authorities, accident claim adjusters, traffic experts, mechanical engineers.

# THE CHIEFS OF POLICE

These opinions were selected from similar opinions by the heads of the Police Departments of more than thirty cities:

**GEO. A. S. KIMBALL**—City Marshal, Concord, N. H.:

"The sound produced from the bulb-horn has become so familiar to everybody that it is not noticed by a great many, any more than the hourly striking of the town clock. A louder and different tone of horn would be better and accidents would be less frequent."

**A. F. McDONALD**—Chief of Police, Bismarck, N. D.:

"I consider the bulb-horn insufficient and unreliable. We want something more harsh and commanding to give warning, and in my opinion the electric horn is here to stay."

**R. A. WALTERS**—Chief of Police, Tallahassee, Florida:

"It's my opinion that the bulb-horn will soon be a thing of the past and that the electric signal is the thing to have on automobiles as a signal."

**JOHN KEEGAN**—Chief of Police, Meriden, Conn.:

"The bulb-horn is too soft and mellow of sound to give good service. You need a horn that has a sharp, piercing, shrill sound to stop the people when they are signaled."

**W. E. SIMS**—Officer in charge of Motor Vehicles, Portland, Oregon:

"A bulb-horn is no good. One needs a loud and sharp blast that can be heard distinctly."

**W. W. RHOADES**—Superintendent of Police, Peoria, Ill.:

"The bulb-horn used on motor vehicles is of no value as a warning signal in my opinion. The signal required to make people pay attention should be harsh and abrupt; and sure to operate when required."

**JOHN C. DAILY**—Lieut. in charge of Traffic Squad, Minneapolis, Minn.:

"A few years ago when there were not many automobiles in use the bulb-horn was all right. At present there are so many automobiles that one can plainly see the difference between the bulb-horn and the electric horn. When an automobile comes along with the

bulb-horn and gives a warning signal no one pays any attention to it and very often the driver will have to stop his car to avoid accident. With the electric horn people will look up and keep out of the way of danger."

**S. C. ELWORTH**—Chief of Police, Rutland, Vermont:

"In regard to the bulb-horn—it's no good. Give us something that a farmer can hear when ahead in the road, and get out of the way. The bulb-horn is not loud enough even for street traffic."

**JAMES R. CROWLEY**—Chief of Police, Newport, R. I.:

"I have never yet seen a bulb-horn sufficiently effective to fill the purpose for which it was devised. The sound evolved is not loud enough or distinctive enough to command instant attention—neither is the device reliable."

**J. L. BEAVERS**—Chief of Police, Atlanta, Georgia:

"In our city, Atlanta, we have very narrow streets and a tremendously heavy traffic. I have had great experience in dealing with traffic problems and I am brought face to face every day with actual traffic conditions in Atlanta. Oftentimes the lack of a good signal and the willingness on the part of the driver to use it, is responsible for collisions and accidents, and every automobile should be equipped with a signal horn with a note that is loud and strong enough to warn a person of approaching danger. The bulb-horn can scarcely be heard above the sound of our heavy traffic and its note is ineffective and a more efficient warning signal device should be attached on every automobile, and we should have a rigid law compelling the driver to sound it as a warning in time of danger."

**J. W. SIGMAN**—Chief of Police, Laramie, Wyoming:

"A bulb-horn is inadequate as a danger signal; in time of danger a driver should keep both hands on the steering wheel, the sound of a signal should be sharp, distinct and clear—all of which are foreign to the old bulb-horn."

**C. F. P. FROMM**—Chief of Police, Council Bluffs, Iowa:

"The bulb-horn for use by motorists as a warning signal to pedestrians and others, is in my opinion absolutely a thing of the past. It is out of date. People no longer appear to pay any attention to it. It is practically useless in cities where traffic is at all congested. It is inadequate. Owners of automobiles are rapidly replacing it with the electric horn which has been found effective."

**W. H. FARRINGTON**—Chief of Police, Battle Creek, Mich.:

"The bulb-horn on an automobile is about as much use to attract attention or sound as warning, as an old joke is to create a laugh. The bulb-horn is a thing of the past and no good in a crowded thoroughfare as the Traffic Officer or pedestrian can not hear them until within a few feet of them. In the present age we must have something that will attract or command attention, warn people of danger and the Traffic Officer of their presence."

**C. H. TROYER**—Chief of Police, Duluth, Minn.:

"My observation has been that people pay but little attention to the bulb-horn, and in order to get an opening into a street which is congested it is necessary to have something which will attract more attention than the ordinary bulb-horn."

**HENRY D. COWLES**—Chief of Police, New Haven, Connecticut:

"In my opinion the old-time bulb-horn is antiquated and ought to have been disposed of long ago. It does not fill the bill in any respect, as in many cases the bulb-horn does not work satisfactorily, and doesn't make a noise loud enough to be heard across the street especially in congested districts where the traffic is very heavy and with the hustle and bustle of trolley cars and other vehicles the sounds made by bulb-horns are not loud enough to attract the attention of the traffic policemen. Therefore, the so-called bulb-horn is practically useless."

**THE Klaxon is now included in the regular equipment of twenty-four different motor cars.**



LOVELL-McCONNELL MFG. CO., Newark, N. J.

## KLAXON

"The Public Safety Signal"





F-S DELIVERY CAR  
TYPE 8  
Price **\$850**

#### SPECIFICATIONS

**Motor:** Beaver four-cylinder, four-cycle; 1 1/2 inch head cast in pairs, bore 3 3/4 inches, stroke 4 1/2 inches, 25 H. P. **Cooling:** Thermo-syphon, belt driven fan. **Radiator:** Large fin type. **Lubrication:** Circulating system with constant level maintained by external gear-driven pump. **Ignition:** S-X Magneto. **Carburetor:** Stromberg. **Frame:** Pressed steel. **Springs:** Front semi-elliptic, rear three-quarter elliptic. **Transmission:** Improved friction control, patented. **Body:** Open or Enclosed Type. **Gasoline Capacity:** 15 gallons. **Tires:** 32x3 inches, road clearance 10 inches, wheel-base 98 inches, tread 56 inches. **Equipment:** Two gas headlights with generator, square, oil side and tail lamps, horn, and complete set of tools, including pump, jack and repair kit. **Weight:** 1,550 pounds. **Price:** \$850.00  
F. O. B. Milwaukee, Wis.

## "PUT YOUR BUSINESS LOADS ON AN F-S DELIVERY CAR"

**T**HAT is the suggestion wide-awake dealers everywhere are making business men. The F-S delivery car at \$850 is, in comparison with existing prices, worth between two and three hundred dollars more than is asked for it. If you don't believe it, look it over, part by part.

Examine, for instance, the power plant—a BEAVER long-stroke motor especially designed to meet the arduous requirements of rapid delivery. The long stroke adds materially to the power usually found in motors of this size. Inspect the transmission, operated on the friction principle—a principle which has proven in the case of commercial cars to be more efficient and economical than any other. And so on down. Then try to equal these features in any commercial car at the price—\$850. You cannot do it!

This is the car motor-wise business men in ever increasing numbers are demanding—a commercial car made right and sold right. Sooner or later you are going to handle a commercial car as part of your regular line. You have got to come to it. Why not associate yourself with a self-selling car—the F-S—NOW? Over 15,000 commercial cars will be sold in the next six months. A good number of them will be F-S cars. How about your share of the profit? Our generous dealers' proposition will tell you how to get it. WRITE US.

## PETREL MOTOR CAR COMPANY

Makers of 800 lb., 1500 lb., and 3 1/2 ton Commercial Cars

MILWAUKEE, WISCONSIN



# The Atwater Kent Ignition System

Thousands of Dealers and Repairmen Recommend Atwater Kent Ignition to their Customers.

Why?

Because they know from experience that its hot dynamic spark will bring out the best that is in any motor—old or new.

They know that the Atwater Kent System with its three simple moving parts—its single, mechanically-operated contact—renders better ignition service than the best dual systems at less than half the cost.

The following is but one of many similar letters we are constantly receiving from men who know:

NATIONAL GARAGE & REPAIR CO.  
CAMBRIDGE, OHIO

March 28, 1912

Atwater Kent Mfg. Works, Philadelphia, Pa.

Gentlemen: Relative to Unisparker, will say that we, as well as our customers, are exceedingly well pleased with this system. Simplicity is a virtue in ignition, and the Atwater Kent is that personified. The snappy, fat spark, occurring in all cylinders exactly alike, plays no small part in adding to the true, even running of the motor. We shall with pleasure recommend the Unisparker upon all repairs of this nature in the future.

Yours very truly,

NATIONAL GARAGE & REPAIR CO.

The Atwater Kent System is easily installed on motors of practically every make and model. It can probably solve your ignition problem no matter how difficult it may be.

Write today for illustrated booklet "A" full of interesting ignition information

**Atwater Kent Mfg. Works**  
Sixth and Arch Sts., Philadelphia, Pa., U. S. A.

NEW YORK.....E. J. Edmond Co.  
BOSTON.....F. R. Parker Spec. Co.  
CHICAGO.....Motor Car Supply Co.  
SAN FRANCISCO, Chanslor & Lyon M. S. Co.,  
Weinstock-Nichols Co.

MILWAUKEE.....Julius Andrae & Sons  
OMAHA.....Omaha Rubber Co.  
CHATTANOOGA.....Sanford Bros.  
DALLAS.....Fisk Co. of Texas  
AUTO EQUIPMENT CO.....Denver, Colo.

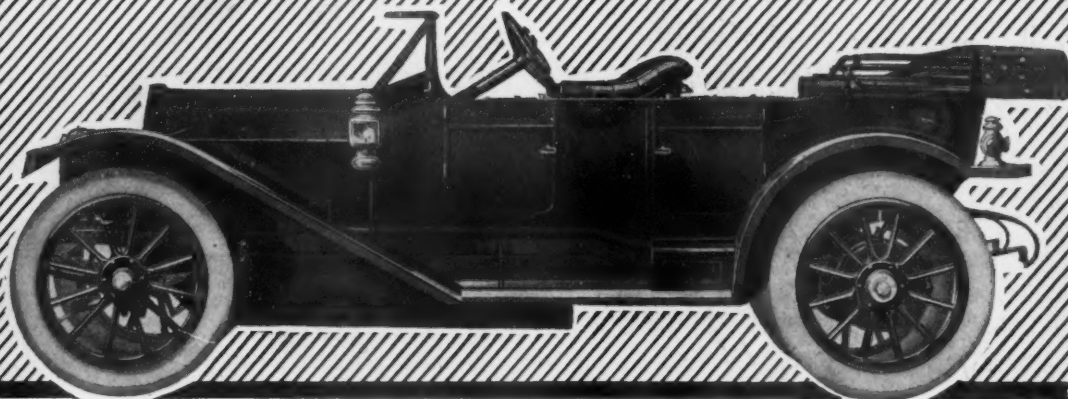
When Writing to Advertisers, Please Mention Motor Age.



Kick  
Switch  
Coil



# EVERY INCH A CAR



## Service Everywhere

**S**ERVICE buildings in principal cities throughout the United States, with effective service organizations and equipments, co-operate with selling branches and agencies in extending completest service to KisselKar owners, both of pleasure models and commercial vehicles.

Whatever might go wrong is made right without long waits or annoyances. KisselKar service is the kind that minimizes operating costs and depreciation, and insures the fullest car satisfaction.

**"Thirty" \$1500**

**"Forty" \$1850**

**"Fifty" \$2350**

**60 H. P. "Six" \$3000**

Prices, except on the "Thirty," include full equipment—top, wind shield, detachable rims, shock absorbers, speedometer, etc.—everything belonging to a perfectly dressed car. The "Thirty" has more than usual equipment.

Write for 1912 Catalog—one of the most informing automobile books published

**Kissel Motor Car Co., 121 Kissel Avenue, Hartford, Wisconsin**

**Boston New York Chicago Milwaukee Kansas City Los Angeles Minneapolis**

**Philadelphia, Cleveland, Detroit, St. Louis, Dallas, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout the United States.**

# KISSELKAR



# THE LONG HORN



**\$18.00**

## THE WARNING SIGNAL THAT COSTS LEAST AND DOES MOST

THE FIRST COST OF THE LONG HORN IS THE LAST COST.

THERE IS NO MAINTENANCE EXPENSE.

IT COSTS NOTHING FOR MOTIVE POWER. No Battery is needed. It makes no demands on your engine. It does not even borrow from the exhaust.

It is simple in construction. There are no complicated parts. Mechanically perfect, it cannot get out of order.

The Long Horn is hand actuated. A touch of the hand or elbow serves to operate it—the warning note is instantly produced.

The powerful, sonorous warning note is unmistakable. It is far reaching, penetrating, insistent.

This is the horn that is rapidly replacing all other warning devices and coming into universal acceptance as the best auto horn made.

It has none of the drawbacks that make the Electric, Bulb and Exhaust Horns of questionable values. A signal device is no use to the motorist if he cannot depend on it. The Electric is subject to disorders and break-downs of electrical apparatus, the Bulb is simply futile and the Exhaust Horn erratic, liable to be clogged when in need and uncertain at all times. The Long Horn alone is absolutely dependable, certain in operation, efficient in result. Easily and quickly attached on any car.

The Price—\$18.00, is the first, last and only cost of the Long Horn. Dealer proposition very attractive. Write NOW.

### THE G. PIEL COMPANY

13th Street and Boulevard,

LONG ISLAND CITY, N. Y.

Sales and Attaching Rooms, 51 West 63rd Street, Corner Broadway, New York City

BOSTON BRANCH: 109 Massachusetts Ave.

PHILADELPHIA BRANCH: 1416 Vine Street

MINNEAPOLIS BRANCH: 70 South 10th Street

# DAISY LIGHTING SYSTEM

FOR ELECTRICALLY IGNITING GAS HEAD LIGHTS



Just this, conveniently located on the dash or heel board. No batteries, coils or vibrators. Works from the motor ignition system. Costs only ten dollars. Complete with all tubing, wire and connections, ready to install. Costs absolutely nothing to maintain and saves gas, temper and time. Sold with a positive money-back guarantee that puts it up to the Daisy and us to make good.

All you have to do is open the cut-off valve full—gas pressure is permanently taken care of by the regulating valve, and press the button. All done in a quarter of a minute without leaving your seat or taking your eyes from the road.

*Write for illustrated descriptive circular that gives all the details*

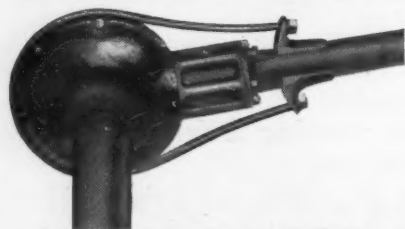
## Simkin Manufacturing Co.

1507 Michigan Avenue,

Chicago, Ill.

Dealers, Repair and Garage Men — Write for our special circular showing why the Daisy Lighter brings substantial profits on easy sales

## The Gardner Patented Rear Axle Truss



**WILL STRENGTHEN YOUR FORD "T" REAR AXLE 500 PER CENT**

Stops that chattering and vibration. Keeps the grease in and the dirt out. Can be installed on car in three minutes. Short truss for 1910 cars with babbitt bearing.

Long truss for 1911 cars with roller bearings.

Special long truss for 1912 cars.

**All sizes for \$3.00 each**

F. O. B. Chicago

Write for scheme for getting pistons out of FORD engine without taking engine from car

### GARDNER ENGINE STARTER CO.

1451-1453-1455 Michigan Avenue  
Chicago

## Motor Ignition Appliances

A Practical Treatise

on the Application of Electricity in the production of the Ignition Spark in Petrol Motors  
By T. H. HAWLEY

Author of

"Motors in Principle and Practice," "Petrol Motors Simply Explained," etc.

### CONTENTS

- |  |   |
|--|---|
| I. Introduction.   | XV. The Magneto and the Electro Dynamo.                 |
| II. Outlines of Electric Ignition.   | XVI. The Low and High Tension Magneto Systems.          |
| III. A Brief Explanation of Some Electrical Terms Commonly Used.                               | XVII. Other Variations of Ignition Systems.             |
| IV. An Outline of the Methods by Which the Desired Mixture is Attained and the Spark Produced. | XVIII. Resistance.                                      |
| V. Some Methods of Wiring up the Electrical Circuit.   | XIX. Testing for Faults.                                |
| VI. Accumulator Construction.  | XX. Accumulator Repairs.                                |
| VII. The Accumulator—Discharging or in Use.  | XXI. Testing Instruments and Their Use.                 |
| VIII. Accumulator Charging.  | XXII. The Mounting and Fixing of Ignition Apparatus.    |
| IX. Accumulator Charging Boards and Methods of Connecting Up.                                  | XXIII. The Switch: Various Systems Explained.           |
| X. Sparking Plug Construction.   | XXIV. Conductors and Connections.                       |
| XI. The Induction Coil.  | XXV. Spark Distribution in Multi-Cylinder Engines.      |
| XII. The Contact Breaker and Advance Spark Mechanism.  | XXVI. Ignition Manipulation and Starting on the Switch. |
| XIII. Trembler Coils and the Auto Tumbler.   | XXVII. General Hints on Methods and Appliances.         |
| XIV. Magnets and the Magnetic Field, Lines of Force, Etc.                                      |   |

Fully Illustrated. Size 5½x8½ inches. Price, postpaid..... **\$1.50**

The Class Journal Co., 910 S. Michigan Ave., Chicago, Ill.





## HUB ODOMETER

**T**HE VEEDER HUB ODOMETER solves the perplexed problem of recording the TRUE mileage of any motor-propelled vehicle, in that IT POSITIVELY CHECKS DISTANCE TRAVELED BACKWARD AS WELL AS FORWARD.

You or yours can't fool it—it cannot be disconnected by slipping gears out of mesh—the record the Hub Odometer makes “goes,” as it cannot be tampered with—it is impossible to subtract mileage by running the wheel backward or to falsify returns by putting the Odometer out of service during a run.

Affording an infallible check on “joy-riding” and an absolute tally of tire mileage with pleasure cars, the VEEDER HUB ODOMETER is a PLAIN NECESSITY for commercial trucks and taxicabs. With its use tire, oil and gasoline consumption, and wear and tear, can be accurately checked, for comparative purposes, and the dishonest or careless driver is “nailed” by the record.

Neat, durable and compact, it can be easily attached. Price complete.....  
At your dealers', direct from our factory or at the following agencies:

**\$25.00**

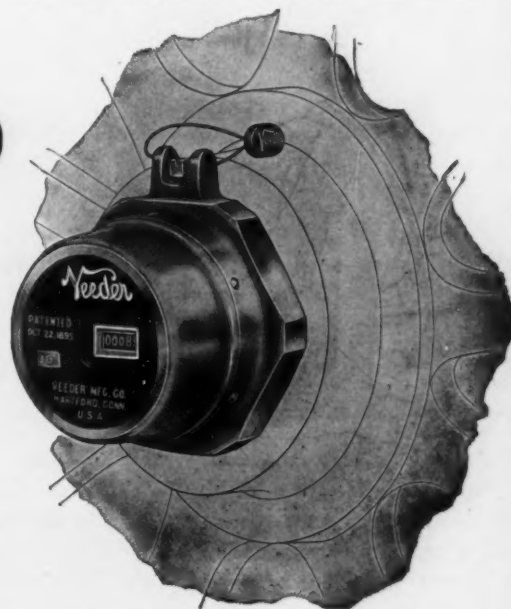
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L. H. & B. I. Bill, 543 Golden Gate Ave., San Francisco, Cal.  
The Rubber Tire Wheel Co., Montreal, Quebec, Toronto,  
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**HARTFORD, CONN.**

*Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Small Die Castings*



# EFFICIENCY

## LETTER No. 8

The term EFFICIENCY is as indefinite in real meaning when applied to storage batteries as is "PREDESTINATION" in matters religious.

Ordinarily, PRACTICAL EFFICIENCY means ability to CONTINUE useful work over a protracted period, with minimum deterioration and expense. Inasmuch as a person's time is worth money, the more time one has to spend taking care of a piece of apparatus, the more it is costing, in addition to the depreciation, and the less the PRACTICAL efficiency of the device to him.

We are told in one breath that lead batteries have 75 per cent efficiency, and in the next, "Give the battery a prolonged overcharge every two weeks. This overcharge should continue at about 60 per cent of the eight hour rate until free gassing of the negative plates has continued for an hour." Again, "Cells which stand a considerable time unused—say as long as 45 days—should be overcharged as directed. It is best to give them a slight charge and discharge about once a week if practicable."

EDISON BATTERY instructions suggest that they be overcharged at the end of thirty days and sixty days of use and thereafter every two months. Overcharging in this case means prolonging the charge for several hours more than the normal charging time, a few times a year. This amounts to very little as compared to overcharging every two or three weeks.

The lead battery claims 75 per cent watt hour efficiency. It would be interesting to know to what account the current wasted on these overcharges, which performs no useful work other than acting as a "tonic," is charged up.

Puts one in mind of a stereotyped regular contract, PLUS EXTRAS.

Practical folk will agree that EFFICIENCY means the greatest amount of work done in a year or in five years, with a minimum of expense. EVERYTHING must be counted.

This subject is one that can be best expressed in parables:

A windmill salesman comes along and sells to an unsuspecting farmer a perfectly good windmill, and a new kind of TANK. The farmer has learned to look upon TANKS as containers of water, or whatever is pumped into them, for its storage until used, when and how he desires.

The outfit arrives and is installed by the windmill men. The farmer pays his money and sits down to peruse the forty-page book of "Directions and Rules for Operation" he was handed when the transaction was closed. He reads:

1. Don't drain ALL the water from the tank at ANY time except as below specified.
2. Never allow water to be pumped into the tank until it is at least two-thirds empty.
3. Then start windmill RIGHT AWAY and don't let it stop pumping until the tank is full.
4. Never let tank temperature rise above normal.
5. Go over all the rivets of the tank once a week, using a CADMIUM hammer, to determine their condition.
6. Buy a water meter, connect it to the tank once a week, and see if the water is flowing properly; if not, pump water in, allowing it to overflow until it does run out properly.
7. If you are called away for over forty-five days, and don't use the tank, pay someone to come around every two weeks, start the windmill, and pump water into it. It is better to let some of the water run out before you do so.
8. If tank is to remain unused two months or longer, send for a boiler maker and his BLOW TORCH, drain the tank, remove all the rivets, take all the plates of the tank apart, wash them thoroughly, and store them away.
9. If the plates have swelled, hire a road roller or a cotton press to squeeze them back to thickness.
10. When you come back and want water, send for your boiler maker and his blow torch, reassemble tank, using new rivets, allow tank to overflow for some time before using the water.
11. Be sure your main pipes from tank do not burst at any time, because if you remove the water from the tank too quickly, it will buckle the plates and ruin it.
12. Be sure the windmill never pumps water into the tank too fast, as this will injure the tank.
13. Every twelve or eighteen months remove all sediment, send for your boiler maker and his torch, remove all rivets, take the tank apart, clean all the parts, reassemble, using new rivets.
14. Never allow the tank to be filled when the temperature of the same is above normal.



15. Similarly, never use water from the tank when the temperature of tank is above normal. Your convenience and necessity is of secondary consideration.

16. If you do not have use for all the water your mill pumps, better let two-thirds run out about once every month and refill the tank.

17. Filling and using tank causes the water to change its density, so that you must buy a HYDROMETER and test said water once a week. If reading of the hydrometer is .05 from standard density, add chemicals or pure water to bring it right.

The farmer's crops suffer, but he sticks manfully to his task. Finally, after about the 300th time water has been pumped into the tank, he happens to glance skyward and notices a flock of large blackbirds soaring overhead. He has performed an autopsy!

He tears out the tank, uncouples the windmill and goes back to the well bucket.

About this time, a drummer comes along from another windmill and tank manufacturing concern. The dogs are unleashed! But he waves a guarantee flag of truce, and THIS time the farmer asks first for "Directions and Rules for Operation" of his particular kind of tank.

He finds:

1. Let tank run over a little while when you have used it for thirty days, and sixty days; thereafter about once every two months.

2. Put some water into the little receptacle we furnish, and every now and then turn the faucet of this little device until the bell rings.

3. Keep the exterior of your tank clean.

4. Forget the tank the rest of the time.

5. If, at the end of four years' use, the tank is incapable of showing its original rated capacity, we will repair or replace it free of charge.

### THE FARMER GRADUATES FROM THE WELL BUCKET FOR GOOD.

Do you think that the first salesman could have gotten within a mile of that farmer if the second had arrived first with his "Directions for Operation" referred to in his catalogue?

Before purchasing ANY piece of apparatus, it is a wise plan to ask the manufacturer for a copy of the Instructions on which the Guarantee is based.

It is then a good plan to pay a lawyer a few dollars to tell you whether or not the guarantee MEANS anything.

Then, with a full realization of the duties you must perform, it is up to you to figure

whether it will pay you to spend MORE money for a device that will LAST, stand considerable neglect, and GIVE YOU GREAT PEACE OF MIND, or whether you wish to pay less money originally, face a large deterioration charge, figure your own time at its value, or insure against the probability of the man to whom you assign the duty of caring for the car, deciding he knows more about storage batteries than the manufacturer, and compromising by doing nothing at all.

I wish to especially call your attention to the fact that the EDISON STORAGE BATTERY can be recharged at ANY TIME, WITHOUT DETRIMENT, irrespective of the energy which has been taken from it.

It can also be taken from charge and put on discharge, regardless of whether it has been fully charged or not.

The EDISON STORAGE BATTERY may be charged at four times its normal rate for fifteen minutes, or three times its normal rate for thirty minutes, or twice its normal rate for one hour.

This is an exceedingly valuable feature, not possessed by other batteries, without detriment to them.

For instance, a truck, with a capacity of fifty miles per charge of EDISON BATTERY comes in for the dinner hour. While standing idle it is put on charge, at twice the normal charging rate. By the end of the dinner hour, from fifteen to twenty miles capacity has been returned to the battery.

This feature also removes a large load from the Superintendent of Delivery during the rush or holiday season. By "boosting" the battery each time the truck comes in for a load, it can be operated day and night with only an intermission of a short time, to enable the cells to be replenished with water by means of our electric filling device. I will tell you more of this later.

Respectfully,

MILLER REESE HUTCHISON,

Chief Engineer to and Personal Representative of  
Mr. Edison.

To be continued next week.

**Edison Storage Battery Company, 146 Lakeside Ave., Orange, N. J.**

Dictated to the Edison Dictating Machine

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# At Last a Tire Filler

## ZiLiO

### RESILIENT AS AIR

Zilio is a vegetable compound made under a secret formula. It contains no rubber. It is much more resilient than rubber. Send 10 cents for sample.

Zilio is not affected in any way by heat or cold, water, air, or pressure. See letter on opposite page. You can boil it for hours, it makes no difference. When confined under pressure it possesses a wonderful resiliency—equal to that of air, yet without the quick rebound that air always gives. Zilio rides **easier** than air. Prove it **at our risk**.

Zilio is made in "logs" about 2 feet long. It is made in exactly right sizes for every size of tire. Its installation is simple. Any man can fill tires with Zilio after seeing our illustrated instruction

sheet. The "logs" are "sprung" into the casing (no inner tube is used) and clamps are used to close up the casing till the Q. D. lock ring can be replaced. That's all there is to it.

Zilio is not in the least like any other tire filler. Send 10 cents for sample. If you would banish fear of tire troubles—use Zilio. If you want to cut tire expense in half—use Zilio. If you want to ride easier over rough roads—use Zilio. Air leaks through a pin hole and plays sneaking tricks on you. Zilio won't leak. It's always on the job—saves you money, time, trouble.

Read on opposite page the letters from Zilio users. Zilio is safer than air, rides easier, saves on casings.

## *Sold on 60 days' trial at our risk*

### Big Money in the Zilio Agency

If you could see the cars in Chicago **standing in line** to have their tires filled, you would waste no time securing the agency for Zilio **somewhere**. Right now the whole United States is open. **Your** chance is as good as **anybody's**, if you are a **reputable** business man and have, say, \$2500 capital.

We are not selling territory, nor are we giving away whole states. A Zilio Exclusive Agency will include a sizable city, the county in which it is located and **generally** all adjoining counties. It will require at least \$2500 to handle such an agency, carrying a small stock and having space in which to do tire filling. Such agencies will get the **maximum** discount. In a city of 25,000 and its territory **any** man should **easily** net \$6,000 a year.

A sub-agent will not be required to carry a stock or to do filling. His discount will be smaller. He will take orders and ship wheels for filling to the nearest stock-carrying agency in whose territory he is located. If not located in an exclusive territory he may do business with **any** stock-carrying agent. Thus the stock-carrying agent is **not confined** to his exclusive territory as long as he does not enter another's territory.

If you want to make money out of Zilio, read this over again. Then write us full particulars of your business experience, how you are fixed for capital, what territory you want and give bank or other references. Do it now.

## Zilio Sales Co., 3265 So. Park Ave., Chicago

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# as Resilient as Air

# ZiLiO

## RESILIENT AS AIR

**Swain Manufacturing Company**  
MUFFLERS  
CHICAGO

Zilio Co., Jan. 22, 1912.  
Gentlemen:—

Replying to yours of the 15th inst., will say that we have tested ZILIO in the hottest days of summer, and the lowest zero temperature of the past three weeks. You certainly deserve praise for this wonderful product. Its superiority to air can no longer be questioned. It rides just as easy, but when it comes to the saving on tires it has air beaten to a frazzle.

During the past six months the car has been driven 8,000 miles with ZILIO in the rear and air in the front tires. The casings in which ZILIO was used are still in fair condition, but the same service has worn out two sets of front casings with air. This settled the matter. From now on it is ZILIO for us in every tire of every car we may ever own. Very sincerely yours,

SWAIN MANUFACTURING CO.  
L. O. Swain.

**J. W. BEAMER & CO.**  
AUTOMOBILES  
CHICAGO

Zilio Co., Oct. 23, 1911.  
Gentlemen:—

About five months ago I bought some 36x4½ casings from the junk rubber man to whom they had been sold for junk rubber, each casing having one hole at least one inch in diameter clear through the rubber and fabric. I had these casings at that time filled with Zilio by using a Hegstrom Blow Out Patch of suitable size over the hole in casing.


My engine is a 60 H. P. and the car my own design and build. I frequently travel from 40 to 55 miles per hour with these casings, as I can readily prove by the Chicago Police force, or, to go further in this matter, call to see me and I will give you a ride on my old flyer that you will never forget, and one of the smoothest rides you have ever had.

Quite a number of my friends and customers have ridden with me at different times, and, not being previously informed of the change in tire equipment, frequently remark: "Beamer, why is it that this old flyer doesn't bounce going over the street car tracks and bumps, as I notice you go over the tracks like a shot." They say I drive too reckless. I could not drive this way only for the fact that my tires are filled with ZILIO, and I am not afraid of my tires running flat or bursting, causing me trouble. I have in the past few years had quite an experience in filled tires of different kinds, but after testing out ZILIO find it to be the best article that has ever been placed on the market.

Yours very truly,  
J. W. BEAMER.

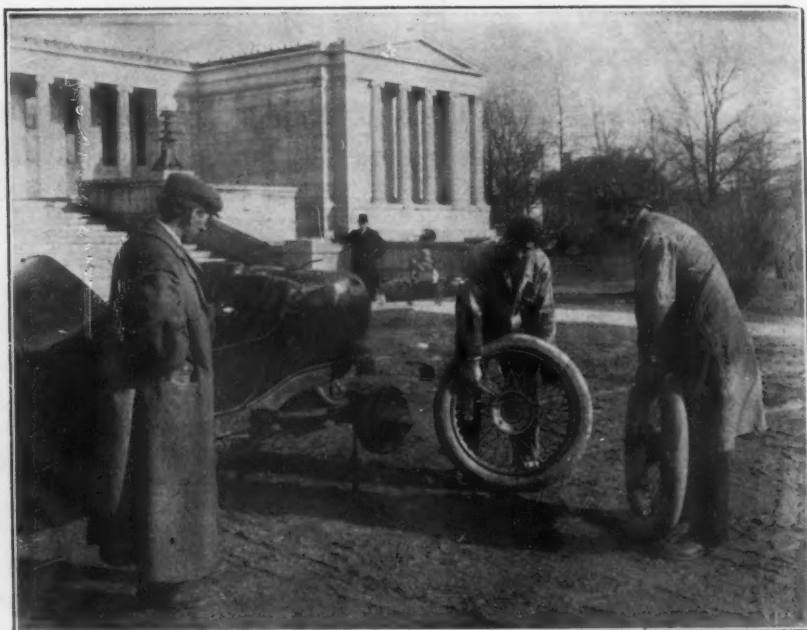
**Guaranteed for 2 years' satisfactory service**  
Send 10 cents for Sample of Zilio

Send 10 cents, coin or stamps, for a sample of Zilio. Don't hesitate. Don't doubt. Test with your own hands the only substitute for air that is better than air. Clip the coupon as a reminder to send for sample. You haven't done all you can do to make your car **safer, easier-riding, more enjoyable** till you get our price for filling your tires with Zilio. We can arrange for you to test Zilio in your tires at our risk.

**Tear off Coupon. Now** 

**A REMINDER**  
To send 10 cents, stamps or coin, for sample  
of Zilio to  
**ZILIO SALES COMPANY**  
3265 So. Park Ave.  
Chicago

## Wire Wheels & Automobile Axles



McCue detachable wire wheels and racing axles on the Columbus Firestone Entry in the five hundred mile free-for-all at Indianapolis, May 30th.

We are making detachable wire wheels for three thousand pound cars and under, also four thousand pound cars and under, and with double row of spokes for our own axles and triple row of spokes for axles made for wood wheels.

### 70 per cent

tire economy guaranteed — to say nothing of increased motor efficiency, etc.—with our wire wheels.

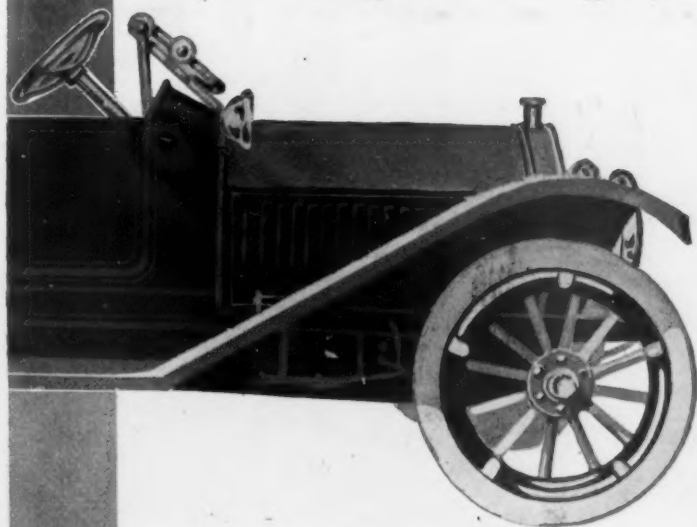
Get in Your Order Now for 1913 Samples

## THE McCUE COMPANY

AXLE MANUFACTURERS  
BUFFALO, NEW YORK



## How H. H. Elmer used the Brains of 894 Expert Engineers to design the Grant Six



It's a story that upsets tradition. When we say 894 experts we mean just what we say; 30 of these designed the axles, 20 different men co-operated to design the radiator, 18 others worked out the transmission, and the brains of 42 experienced engineers evolved the 50 horsepower T-head motor. The other 784 planned the wheels, the body, the frame, springs, clutch, gears and every other vital part.

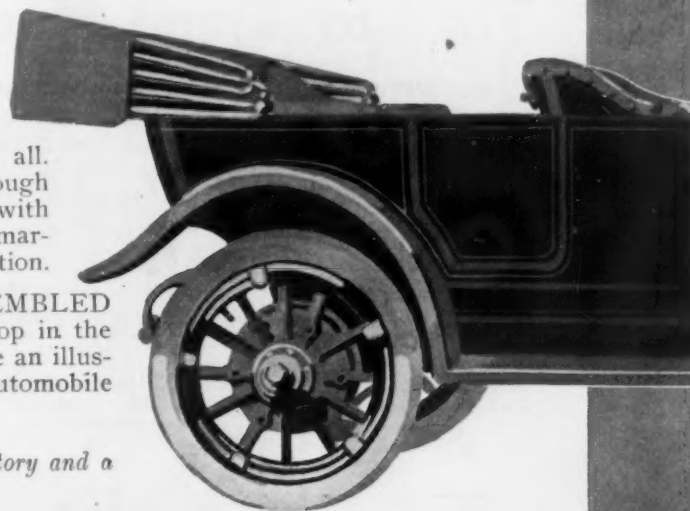
A car is no stronger than its weakest part—that's why we combined the best brains in the United States to build the GRANT-SIX part by part in specialized shops.

How did Mr. Elmer get the benefit of this accumulated brain-force? By going to specialists who had spent their lives in building one particular part for an automobile. He didn't try to establish a "Jack-of-all-Trades Shop." He didn't want to blind the customer with "Big Floor Space" talk. He wanted to offer quality and knew the one way to get it—he let only specialists contribute parts to the construction of the GRANT-SIX.

As a single example—take the axle (though every other part is equally good). It stands to reason that the largest axle manufacturer in the world can build axles better and sell them cheaper than the auto-manufacturer who tries to do it all. That's why the GRANT-SIX drives through large full floating TIMKEN AXLES with 18-inch brake drums—the product of the marvelous TIMKEN PLANT and organization.

The GRANT-SIX is SEMI-ASSEMBLED and we are proud of it. The largest shop in the world can't build a car as good. We have an illustrated folder that tells the truth about automobile building. You want it.

*DEALERS—We have some open territory and a profitable proposition. Better investigate.*



**The Grant Motor Car Company**  
2354 East 69th Street

**Cleveland**  
*South City*



## Toadstools and Mushrooms Look Alike

But you can tell the difference the minute they get into action.

The difference between *speedometers* is chiefly *under the skin*. Some devices carried on automobiles may *look* like *Stewart Speedometers*, but *users* find out the difference. The *Stewart* doesn't travel on its *looks* alone, but it travels on *four* cars out of *five*— and makes *good* on all of them.

It's the most *accurate*—the most *sturdy*—the most *reliable* speedometer made.

By *every* test it's far the *best*.

We manufacture on such a huge scale—our output is so tremendous—that the *Stewart* can be retailed for *less* than the production cost of the *rest*.

Magnetic principle—jewel bearings—wearing parts hardened and polished; open dial—big figures, easily read—absolutely accurate; 100,000-mile season odometer, 100-mile trip register, can be reset to any tenth of a mile. Guaranteed for five years. Strongest flexible shaft—drop forged swivel joint—noiseless gears.

**"ALWAYS ON THE JOB"**



### Stewart & Clark Manufacturing Company

1931 Diversey Boulevard, Chicago, U. S. A.

Detroit San Francisco  
Cleveland Philadelphia

New York Los Angeles  
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Chicago Boston  
London Paris

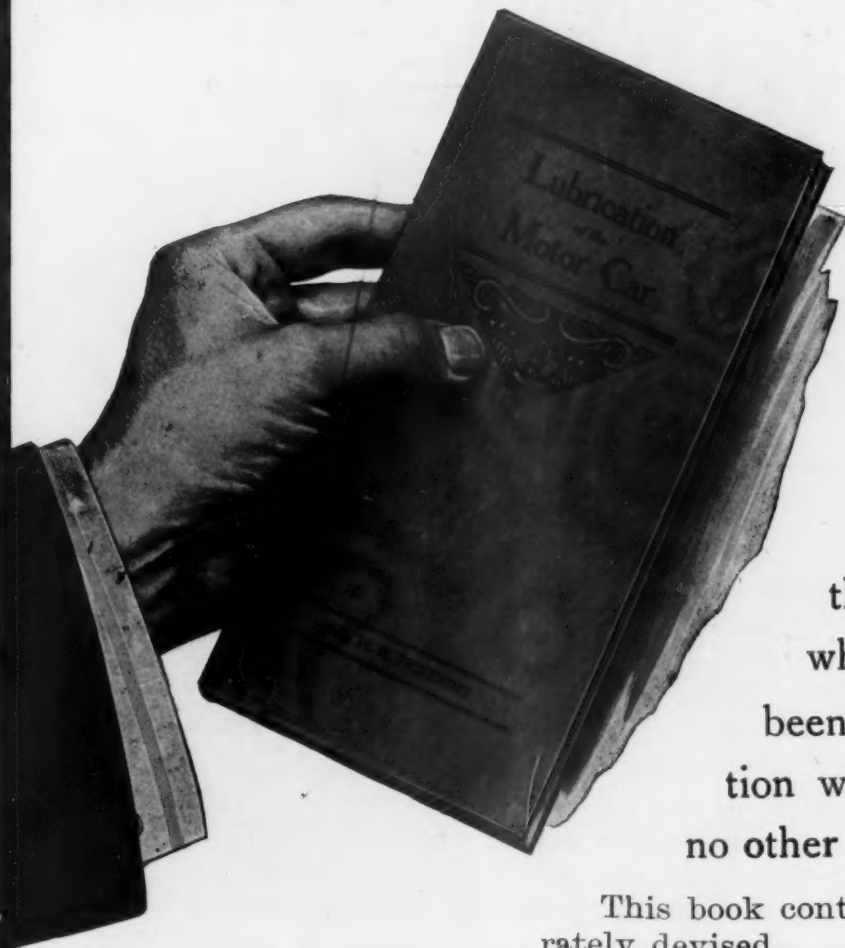
Kansas City

Speedometers, \$15 to \$30

Rim Wind Clock Combinations,  
\$45 to \$70



# Beforehand is the thinking time of wise men



Before you drive  
your car another  
mile, Mr. Wise  
Motorist

## Get this Free Book on Lubrication

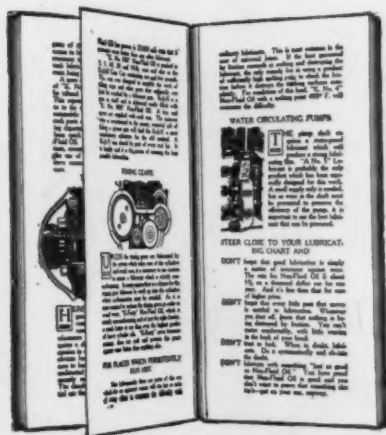
It contains a fund  
of information on  
this important subject  
which has never before  
been published—informa-  
tion which you can get in  
no other way.

This book contains a complete and accu-  
rately devised

## LUBRICATING CHART

which points out details of lubrication which you have probably thought-  
lessly neglected or misunderstood, to the detriment of your car. Consult  
this chart and read the book, before you begin another motoring season.

Send for both today.



Accurate  
illustrations

Authentic  
information

Simply paste this coupon on  
a postal, after filling  
out with care.

**New York & New Jersey  
Lubricant Co.**

165 Broadway New York

Chicago, 1430 Michigan Ave.

Phila., 1416 Vine St.

Distributors for Pacific Coast—

**HUGHSON & MERTON—San Francisco, Los Angeles, Seattle, Portland.**

Please send me your book on Lubrication.

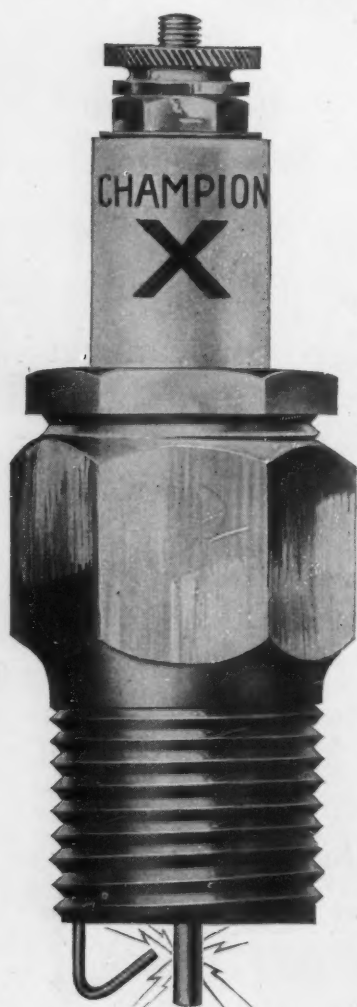
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Dealer \_\_\_\_\_  
Address \_\_\_\_\_  
Car \_\_\_\_\_

M. A.



TRADE-MARK

# Champion Spark Plugs



**CHAMPION X**  
75 Cents

**T**HE ENGINEERING EXPERTS of the country's biggest automobile plants, such as Ford, Overland and fifty others, failed to find a flaw in Champion Spark Plugs. There is no course left to you but to buy Champions. It is the common sense purchase.

Champion plugs are the efficient product of the biggest factory in the world for the exclusive manufacture of spark plugs. The Champion Spark Plug Company need make no wild statements or promises. There is the record of its sales and the buyers.

Get into the procession of Champions. The best plugs made come in a box bearing the "world" trade-mark shown above. "Champion" is stamped on the porcelain.

Manufacturers and agents write us at once.



WHERE CHAMPION SPARK PLUGS ARE MADE IN TOLEDO

## CHAMPION SPARK PLUG COMPANY

Dept. B, TOLEDO, OHIO



It's An Easy Job—with a

# STAPLEY TIRE PUMP

Made by Bridgeport Brass Co.

This powerful, compound pump is the most popular pump on the market. Popular because it

inflates tires quickly, without effort, is always ready and always works.

STAPLEY gives complete satisfaction. It pumps a great quantity of air on every stroke. No trouble to inflate tires with a strong, non-leakable pump like this.

It has seamless brass tube cylinders. It can't rust. Has heavy, cast base, built to withstand the roughest service. Automatic valve-opener—and no complicated parts.

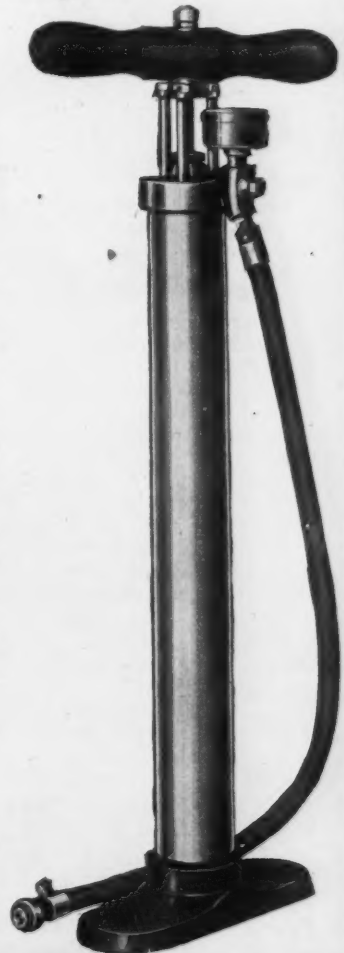
It's hard for us to supply the demand for STAPLEY pumps. Most every motorist prefers the STAPLEY. There's an accurate, guaranteed pressure gauge attached—if you want it.

You know the reputation of the STAPLEY. Get yours today. You'll need it. Above all things don't purchase an ordinary, leaky tire pump. Get the best—the STAPLEY. Ask your dealer.

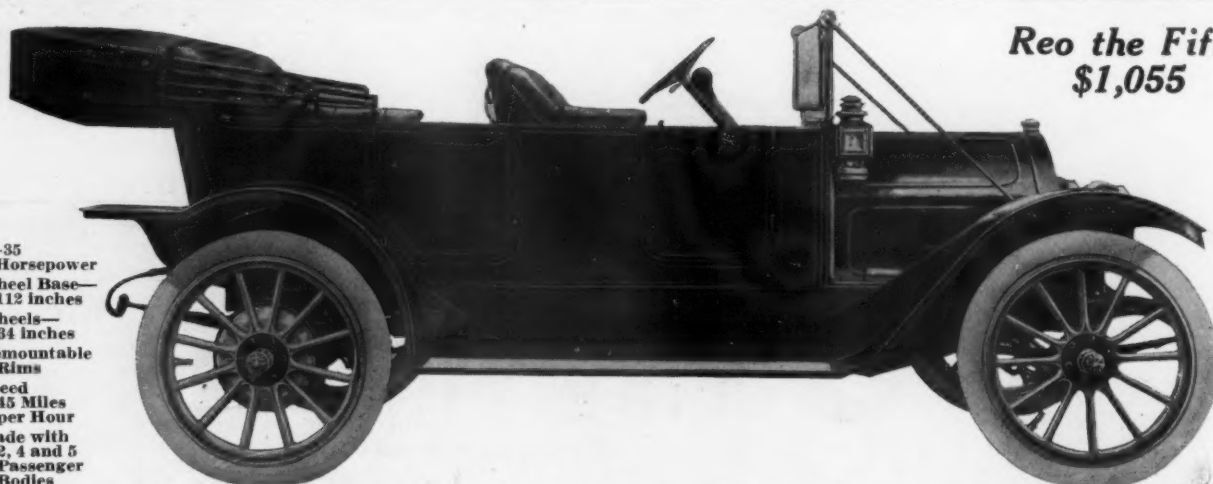
**If your dealer doesn't  
carry it we will send  
the STAPLEY prepaid in  
U. S. on receipt of price.**

Without gauge, \$4.00    With gauge, \$6.00

**BRIDGEPORT BRASS CO.**  
P. O. Station, A    Bridgeport, Conn.



30-35  
Horsepower  
Wheel Base—  
112 inches  
Wheels—  
34 inches  
Demountable  
Rims  
Speed  
45 Miles  
per Hour  
Made with  
2, 4 and 5  
Passenger  
Bodies



**Reo the Fifth**  
**\$1,055**

Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, gas tank and speedometer—all for \$100 extra. Self-starter, if wanted, \$20 extra.

## The 25-Year Car

*By R. E. Olds, Designer*

### Reo the Fifth

Is the only car based on 25 years spent in car building.

In those 25 years I have created 24 models, and have watched their performance with tens of thousands of owners.

I have also kept in touch, since the start of this industry, with all that other men have done.

Here is the final result—my finest creation—the best that I can do.

### How I Watch It

Never was a car so watched in the making as I am watching this. The prestige of a lifetime is staked on it.

In this car we insist on utter exactness, regardless of time. Parts are ground over and over.

Steel for this car is all analyzed, so we know its exact composition. Each car gets a thousand inspections.

The margin of safety in every part is extreme. We old designers know the need for that.

I use roller bearings—Timken and Hyatt—instead of the usual ball bearings. In no part is cost considered.

The carburetor is doubly heated—with hot air and hot water—to deal with low-grade gasoline.

### Unusual Beauty

The car is immensely impressive. It is long and roomy. The wheels are large, the car is over-tired. We avoid all the petty economies.

The body is finished in 17

coats. The lamps are enameled. Even the engine is nickel trimmed.

There is deep upholstery, made of genuine leather filled with hair.

At twice the price no car could offer more comfort or more class.

## The Center Control

### No Side Levers

The best new feature of the year is brought out in Reo the Fifth.

than three inches in each of four directions.

There are no side levers—neither inside nor outside the door. So the entrance in front, on either side, is clear.

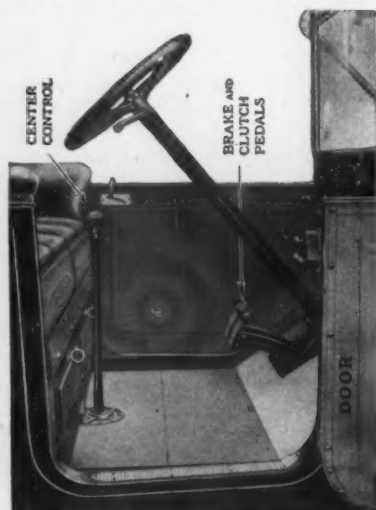
Both brakes are operated by foot pedals, one of which also operates the clutch. Never was a car so simple in operation.

### Left Side Drive

These features permit of the left side drive, as in electric cars. The driver sits, as he should sit, close to the cars he passes and on the up side of the road.

Yet his gear shifting lever is at his right hand, and the brake pedals right before him.

This ideal arrangement is found today only in Reo the Fifth.



It is this center control, shaped like a cane handle. All the gear shifting is done by moving this lever less

### \$1,055 Too Low

The only point which does not meet my approval is this initial price. I believe it too low to continue.

It is based on the present low cost for materials, on enormous output, on ideal conditions.

This price I regard as a passing sensation. It is subject to instant advance. Under average conditions, it would be impossible.

But Reo the Fifth will always sell lower than any other car in its class. We have a model factory, modern equipment, enormous capacity. And we have the experience.

We are not over-capitalized—have no bonded debt. And we save about 20 per cent in the making by confining our output to only one chassis.

Thus the best car I can build is being sold at this moment for \$1,055.

### 1,000 Dealers

Reo the Fifth is shown by dealers in a thousand towns. We will tell you the nearest when you write for our book.

This book shows the various styles of bodies. It pictures every detail. It enables comparison with all other cars. It is the most popular book of the season.

Write for it now. Address

**R. M. Owen & Co.** General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**  
Canadian Factory, St. Catharines, Ont.

[64]





## The Story of the Tell-Tale Dial

Upon the wall of the factory chief's room is a little instrument on whose dial a story is written each day.

A tale white-hot with interest to the man with the key to its meaning. It's a story of faithfulness in the heat-treating of



The instrument with the tell-tale dial is a recording pyrometer.

It is connected each day and each night with one of the heat-treating furnaces—which furnace only the chief himself knows.

Wires lead from the electric resistance thermometer in that furnace to the pyrometer on the chief's wall.

Clockwork and the current operate a pen which records in clear-cut lines the temperature for every minute and hour of the time.

### A Check on Other Records

Out in the furnace room is another pyrometer. That one is for the man who reads the temperature of all the furnaces each quarter of an hour.

He is the man whose signals of red, white or green light at each oven tell the furnace man how to regulate his fire and when to remove the glowing steel.

Now, who is to prove that the work is done

right? Who knows that no one has cooled the furnace by opening its door in the night?

Answer—The tell-tale dial.

### Timken Heat-Treatment is an Exact Science

Each piece in the Timken-Detroit Axle has its particular heat-treatment.

The one treatment which will bring out the best that is in the kind of steel used for the particular work each piece must perform.

Long experience and careful records of results have determined the exact degree of heat and exact length of time for each part. *And the dial tells that the work is done right.*

The story of the dial is one of the interesting stories in Timken-Detroit manufacture.

It is this back-of-the-scenes integrity of manufacture—this extreme care in every process—that produces axles which stand up to the gruelling test of service day after day and year after year over all kinds of roads.

## The Timken-Detroit Axle Company

Detroit, Michigan, U. S. A.

*The only axle manufacturer licensed to make axles equipped with the famous Timken Roller Bearings*

When all automobiles are built alike, one lubricating oil will suit all cars.

When winter is as warm as summer, one grade of lubricating oil will suit all seasons.

When heavy oils flow as freely as light oils, the feed system, and other factors, need not be considered.

Until then no one grade of lubricating oil will suit all cars.

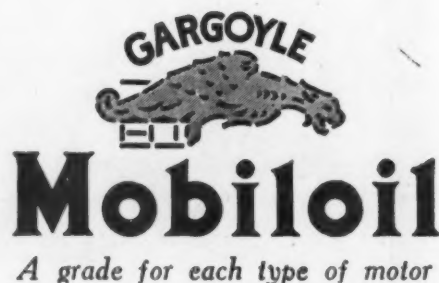
While we are recognized, in power-engineering circles, as the world-leaders in high class lubricants, we find lubrication no simple problem.

In producing a series of lubricating oils suited to the need of all cars, it was necessary for us to analyze the construction of every domestic car and practically every foreign make. We found that several distinct grades of oil were needed.

Our detailed recommendations for 347 makes (in all likelihood including your car) were announced in the April 11th issue of this publication.

These recommendations, in pamphlet form, will be mailed to you on request.

*As oil saves power, it follows that one oil saves more power than another.*



## To the Trade

We have started the strongest advertising campaign ever run for automobile lubricants. In addition to nearly all the automobile magazines, we are using the Saturday Evening Post, Collier's, Literary Digest, Life and Scientific American, and will run later in leading monthly magazines.

If you handle Gargoyle Mobiloils you can offer the right grade of oil for each car. Our advertising aims to establish proper confidence in Gargoyle Mobiloils and in the dealer who supplies them.

# Vacuum Oil Company, Rochester, U. S. A.

DISTRIBUTING WAREHOUSES IN THE PRINCIPAL CITIES OF THE WORLD



# Overland

**O**UR Model 60 has made motor car history. For \$1200 the buyer gets what he cannot duplicate at less than \$1500 in any other line.

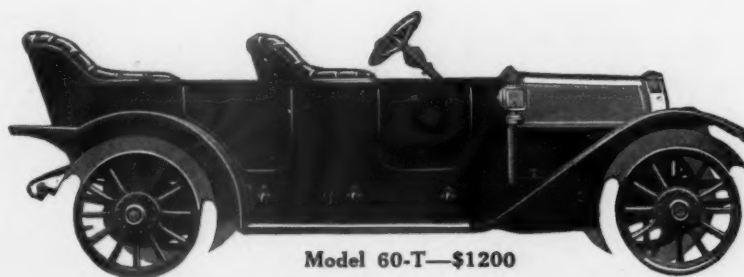
We mean this.

If \$1200 can get you as much as \$1500, why not save the difference?

Twenty-five thousand cars made under ninety-five percent efficiency methods make this value possible.

Better investigate. Write for Book H 44.

**The Willys-Overland Company, Toledo, Ohio**



**Model 60-T—\$1200**

Wheel base, 111 inches; body, 5-passenger fore-door touring; motor, 4½ x 4½; horsepower, 35; Remy magneto; tires, 34 x 4 inch Q. D.; equipment, three oil lamps in black and brass finish, two gas lamps, horn and generator. Self-Starter, \$20 extra.

## What Kind of a Guarantee Do You Want, Mr. Automobile Buyer?

You can tell what any automobile manufacturer really thinks of his own car by the guarantee he puts on it. That proves his own opinion of his car. A signed guarantee means something.

And because one car is not as good as another, and the manufacturer knows it, so automobile guarantees vary.

Some of our competitors guarantee their cars for 90 days. All right; that's better than nothing and good enough for some people. It's even a quarter as good as the Studebaker guarantee. But, of course, if our competitors dared, they would make their guarantee longer.

The trouble is, they know their own cars and want YOU to take the risk.

Then there is another kind of guarantee. A guarantee ashamed of itself, we call it. It really isn't any guarantee at all, because all the assurance you have is the car's "records." That is about as good as a promissory note you can't collect, or a promise that wasn't made. You can bet that the dealer knows the car better than you do and if he won't sign a guarantee, be careful. You don't want to take a mere "noise like a guarantee" for the real thing.

This is where the Studebaker guarantee comes to the front. It is as good as gold—a signed warranty bond of The Studebaker Corporation. And it's good for a year because every Studebaker car is worth the price you pay for it. We know what our cars will do and we put down our money on them.

That's fair, isn't it?

Get a Studebaker and be safe.

Consider this. Did anybody but a Studebaker dealer ever tell you about the guarantee you get?

### The Studebaker Corporation

Detroit, Michigan





## Note These Facts

Get Lubrication, which is the Service a good oil renders in Eliminating Friction.

The oil for motor cars and motor boats that reduces the cost of maintenance, and adds to the zest of these pleasures, is

# Polarine

A FROST AND CARBON PROOF OIL

## The Standard Oil for Motors

Known also as the "Cream of Motor Oils" and "the oil with a clean record."

Motorists are demanding this oil at the rate of  
**5,000,000 Gallons This Year**

—good evidence that it has given satisfaction. Carbon proof—insures easy motoring in tropical and zero weather. Try it.



The "Tool Box" Can With Standard Patent Spout

**For Sale EVERYWHERE  
By All Reputable Dealers**

Try **MATCHLESS LIQUID GLOSS**

*For Polishing*  
Automobile Bodies, Wind Shields, Windows, Etc.

## Standard Oil Company

(An Indiana Corporation)

### The Saving in Barrels

Those who usually buy oil in small amounts can save a neat sum buying by the barrel or half-barrel. It is economy for everyone who owns a gasoline car to buy this way.

### Polarine Lubricants

Prepared in consistencies to meet individual preference—and mechanical conditions of transmissions, differentials, universal joints, ball and roller bearings, timing gears, etc.

"A" grade . . . Semi-Fluid Oil  
 "B" grade . . . Semi-Fluid Grease  
 "BB" grade . . . Semi-Solid Grease

Also include Cup Grease and Fibre Grease of high melting point.

All are called POLARINE and are the recognized standard greases for Motor Car and Motor Boat lubrication.

Each grade has superior merit in durability and cushioning properties.

# Here's the real Spark Plug you want

You have had your experience with the kind that rob motoring and motor boating of a big part of its pleasure. Now you are ready to appreciate a Spark Plug that CAN'T short circuit, CAN'T be ruined by heat, and CAN'T be fouled by anything found in a gas engine.

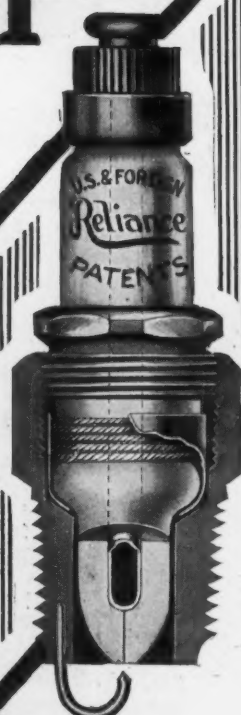
*That Plug is the Reliance—Prove it.*

*More than that—the Reliance Spark Plug and the Reliance Magneto Spark Plug produce a more intense spark with less battery power.*

*The Reliance will spark in water—no other spark plug on earth can do that.*

*The Reliance Magneto Plug will overcome the troubles of your oily engine—for it has a closed end that keeps the oil away from the sparking point.*

*If your dealer is out of Reliance Plugs, we will forward at your order on receipt of price—charges prepaid.*



\$1.00

**Reliance**  
(REG. U.S. PAT. OFF.)  
**Spark Plugs**



\$1.25

If you want to know WHY your engine balks, WHY your ignition is faulty, and HOW to end these troubles forever—this is the book that will tell you. It has run into many editions—and will run into many more, because it is the best book on its subject ever put out.



## Get this Book

It's worth money to you—but it comes FREE—just for the asking. Drop us a card today.

**Jeffery-DeWitt Company**

51 Butler Avenue

Detroit, Michigan

*Largest Spark Plug Manufacturers in the World*

*When Writing to Advertisers, Please Mention Motor Age.*





**AN Announcement  
of Vital Importance To Every  
Manufacturer, Dealer  
and Car Owner Will  
Be Made in the Near  
Future.**

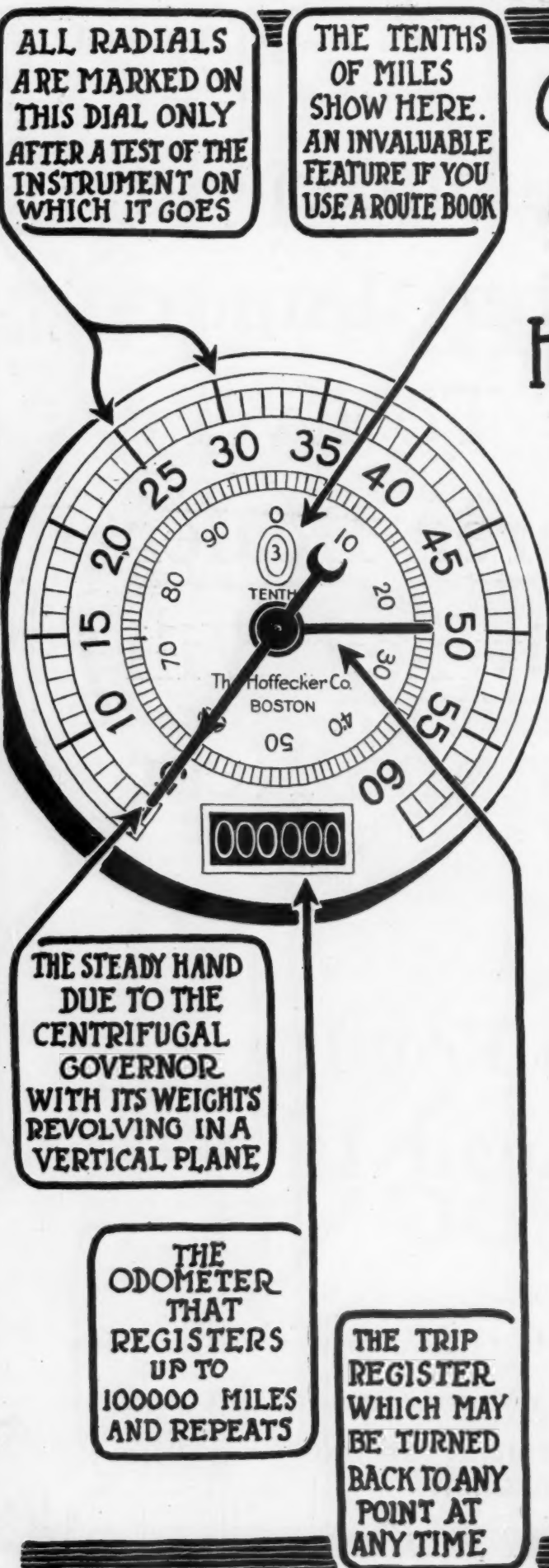
**Watch For It  
and Read It.**

**Manufacturers and Dealers Motor Fire Insurance Company**  
(TO BE INC.)

**Manufacturers and Dealers Motor Casualty Company**  
(TO BE INC.)

**1460 NORTH AMERICAN BUILDING  
PHILADELPHIA**

*When Writing to Advertisers, Please Mention Motor Age.*



## One of the Reasons for the Supreme Accuracy of the Hoffecker Speedometer —The Individually Calibrated Dial

The reason for HOFFECKER supremacy lies in the care of HOFFECKER construction.

Every HOFFECKER SPEEDOMETER is carefully tested before the radials are marked on the dials. This is the only method of securing absolute accuracy, since it is the only way to make the instrument and the dial agree.

The principle of the HOFFECKER SPEEDOMETER is that of centrifugal force. A governor that won't wobble and whose weights revolve in a vertical plane, insures "The Steady Hand."

Three other factors which make the HOFFECKER indispensable to tourists are:

NO. 1—An ODOMETER that will register 100,000 miles and then repeat.

NO. 2—A DIAL on which the tenths of miles are recorded—a valuable feature to any motorist.

NO. 3—The TRIP REGISTER which may be turned back to any point at any time.

No high priced, delicately constructed watch could be more accurate than the HOFFECKER, the speedometer with "The Steady Hand."

### HOFFECKER COMPANY

Motor Mart — Main Offices, Boston, Mass.

#### BRANCH OFFICES

1779 Broadway, New York  
Sherridan & Palma, Pittsburgh  
1217 Huron Road, Cleveland  
1328 Michigan Ave., Chicago  
1334-36 Race St., Philadelphia





A Double Innovation

# WALTHAM 8 DAY TIMEPIECES



Model K



Model D

Cased to match Hoffeecker Speedometers especially for use in Automobiles  
Here is a combination of Two High Grade Products, each a complement to the other, and intended to increase efficiency in automobile equipment

Waltham 8-Day Timepieces are built to Waltham standards, which means that they are the highest, most advanced achievement to date in watches designed and made especially for automobile use.

They are an innovation—something better—the latest example of the watchmaker's skill—in that they are the only 8-day timepieces *adjusted to temperature* and that have 15 jewels. They are equipped with the new patent winding indicator, which gives 3 days' warning for re-winding.

They have that constructive character that

insures *correct time* under the hard usage to which an automobile watch must necessarily be put—the same feature which, for over fifty years, has made Waltham Watches famous and their use universal. They have that artistic symmetry of design and clever richness of material that appeal to those who are particular as to the equipment of their cars.

In order to carry this idea into complete detail Waltham 8-day Timepieces for automobiles are now cased in Hoffeecker style.

For sale by leading jewelers and auto supply houses.

## THE HOFFECKER COMPANY

Motor Mart

Main Offices: Boston, Mass.

1779 Broadway, New York  
Sheridan & Palma, Pittsburg

Branch Offices  
408 Franklin Bank Building, Philadelphia

1217 Huron Road, Cleveland  
1328 Michigan Ave., Chicago



When Writing to Advertisers, Please Mention Motor Age.

# Manufacturers and Dealers

What Does Service Like This Mean to You

?

PORTLAND, ORE.  
 SAN FRANCISCO, CAL.  
**HOWARD AUTOMOBILE COMPANY**  
 957-961 SOUTH OLIVE STREET  
 LOS ANGELES, CAL.  
 AUTOMOBILES FOR PACIFIC COAST  
 AGENTS AND DISTRIBUTORS  
*Brick*  
 (ABOUT 1912)  
 (ABOUT 1912)



**J. I. CASE THRESHING MACHINE CO.**  
 HIGH CLASS ENGINE AND THRESHING MACHINERY  
 HOME OFFICE AND FACTORY, RACINE, WIS.  
 NEW YORK BRANCH, 1260 BROADWAY  
 O. A. LEWELLEN, BRANCH HOUSE MANAGER.

FRANK H. BELL, President  
 FREDERICK H. BELL, Vice President  
 RICHARD T. BELL, Secretary  
 J. I. CASE, Treasurer

New York, N. Y., March 27, 1912.

Remy Electric Co.,  
 1926 Broadway,  
 City.

Gentlemen:-

It affords us pleasure to testify to the efficiency of your service department. Your evidently increased desire to see that the Remy magneto gives satisfaction to customers, backed by your ready support in overcoming complaints and making adjustments cannot fail to rapidly establish the Remy magneto in the confidence of most manufacturers and owners of automobiles.

Yours truly,

*O. A. Lewellen*  
 J. I. Case Threshing Machine Co.  
 Branch House Manager.

Remy Electric Company.  
 Anderson, Ind.  
 Gentlemen:-

We write this letter to express our appreciation of Remy service generally. The fact that your Company has established service stations throughout the country certainly should be appreciated by manufacturers, dealers and users.

Yours very truly,  
 HOWARD AUTOMOBILE COMPANY.  
 Per *H. Howard*

Dir. F. S. R./R. A. P.

Did you ever hear of Ignition Service before the Remy Electric Company created it?

Are you taking advantage of this Remy Service, making it a valuable part of your complete car service?

Let us tell you more about the The Best Magneto and Real Magneto Service.

Factories and General Offices at Anderson, Ind.

When Writing to Advertisers, Please Mention Motor Age.



## **MAY WE HAVE YOUR LAYOUT OF BEARING INSTALLATION ?**

We can save you money, time and trouble,—in other words, show you a short cut to satisfactory bearing installation.

The successful use of New Departures in 60 per cent of the motor cars manufactured in this country proves that the quality of this American made bearing has been well established.

This fact also constitutes a good reason why you should send us your layout and give our engineering and sales departments an opportunity to place our proposition squarely before you.

Our engineering department is highly specialized, not only for the production of superior ball bearings, but for giving to the trade expert co-operative service.

**The New Departure Mfg. Co.**  
**BRISTOL, CONN.**

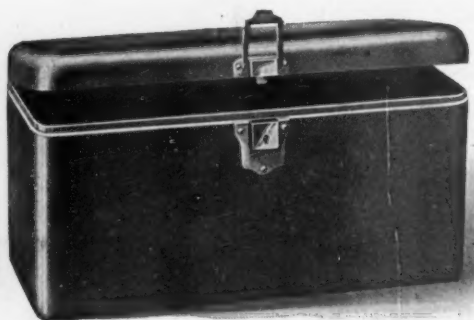
1016 FORD BUILDING, DETROIT, MICH.

# "Hayes" Metal Boxes

For EVERY Man & for ANY Make  
Who Motors of Car

Your car needs a "Hayes" metal box for three reasons: for looks, for convenience, for safety. Maybe a big box, maybe a small one—but **every** car needs a "Hayes," and more than 250,000 cars already are using them.

"Hayes" boxes are low in cost, come in 15 standard sizes and a wide range of styles, and are of superior finish and extraordinary durability.



Style B—\$5.00

With a "Hayes" on your running board, your tools, supplies, batteries, auto-conveniences of every sort are accessible at a moment's notice—but **only to the man with the key**. "Hayes" boxes for cars are made just like "Hayes" boxes for safety deposit—of rolled steel, electrically welded, fitted with "Hayes" special locks (that serve as coverlifts). **Absolutely burglar proof.**

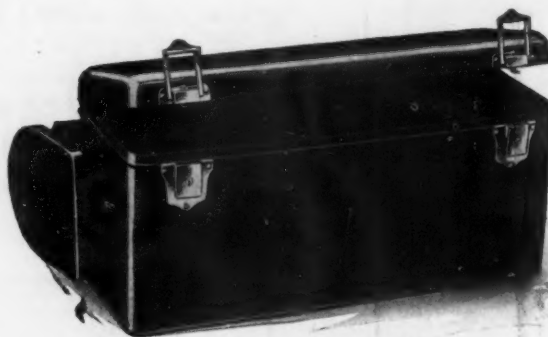
Of beautiful finish (enamel baked on), they do not chip, but hold their gloss indefinitely. "Hayes" boxes come in any color, fit any running board, are made with or without compartments and trays, and combine every feature desirable in a box for wear and looks.

There is a size and style that just suits your car, no matter what the make—and the cost is extremely low—from \$3 to \$12.

Carried by all accessory dealers.

**For Garages**—The "Hayes" drip pan is a fine convenience. It keeps the floor clean, and keeps tires out of the grease (grease is a mighty bad thing for rubber). Price only \$2.

Write today for the "Hayes" catalog of Boxes. And when you buy your box, look for the "Hayes" trademark inside the cover.



Combination—\$12.00

## Hayes Manufacturing Co., Detroit, Mich.

*Largest users of sheet metal in the world*





# FREE

## VALUABLE INFORMATION ABOUT THE G & A CARBURETTOR

### What Users Say

Telephone 1728 Stuyvesant

**FIDELITY DUMB-WAITER GUARANTEE COMPANY**  
142 East 14th Street  
NEW YORK

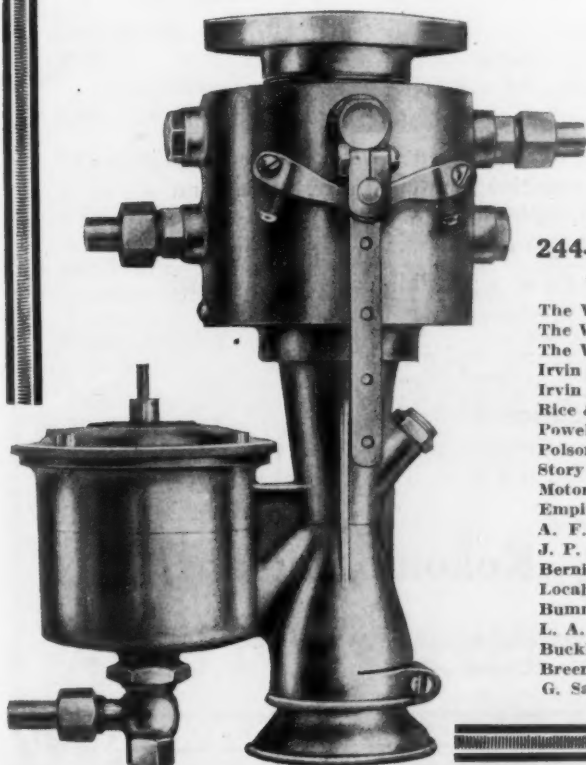
January 8th, 1912.

G. & A. Carburettor Co.,  
244 West 49th St.,  
New York City.

Gentlemen: Since attaching your carburettor to my Chalmers car, I have submitted it to several tests, and take pleasure in advising you that it fulfills every claim you make for it. After a careful comparison of my figures, I find that I am using 30% less gasoline, with an almost equivalent increase in power; in fact my car, which is now almost three years old, seems to have been rejuvenated since attaching your carburettor. I will be pleased to recommend the G. & A. Carburettor to my friends, though I do not think it is necessary, as your product must shortly become the standard carburettor equipment, for it represents a decided advance in the development of gasoline engines. Wishing you every success,

Very truly yours,

*James H. H. H.*



**U**NLESS all signs fail, the season of 1912 is going to be the greatest and most profitable one in automobile history.

To meet the increasing demand for **G & A CARBURETTORS**, we have enlarged our factory facilities and are now prepared to double our output.

We are turning out more carburettors than ever before, and we **can sell** them too. We are in a position to do a tremendous mail order business, but we prefer to sell through direct distributors.

The agencies which we supplied last year will be inadequate to meet the ever growing demand for **G & A CARBURETTORS**, and we must have more distributors. We have the best carburettor. It has been given world-wide publicity, and this, plus the long list of satisfied users, has created a demand for the **G & A CARBURETTOR** which can only be met by increased facilities of distribution. Remember that the agent who stocks the **G & A CARBURETTOR** is handling a carburettor that sells on sight, and once sold, stays sold.

**G & A CARBURETTORS** need no adjustment. A ball cage which automatically controls the supply of air and gasoline insures a perfect mixture. This feature has been imitated by many carburettor makers—a sure sign of superiority, for imitation is the sincerest flattery. Look at our testimonials and see for yourself.

Dealers, there is money in this proposition, and proper co-operation between you and us means a greater number of satisfied consumers, more sales, and more money in your pockets.

Send for our booklet and mention make of car. Familiarize yourself with G & A methods, and with a carburettor that is absolutely "the talk of the trade."

### G & A CARBURETTOR CO.

244-250 West 49th Street

New York City

#### DISTRIBUTORS

The Western Rubber & Supply Co.	1011 South Olive St., Los Angeles, Cal.
The Western Rubber & Supply Co.	1364 5th St., San Diego, Cal.
The Western Rubber & Supply Co.	66 So. Fair Oaks Ave., Pasadena, Cal.
Irvin Silverberg & Co.	335 Golden Gate Ave., San Francisco, Cal.
Irvin Silverberg & Co.	Seattle, Wash.
Rice & Dayton Mfg. Co.	Cedar Falls, Ia.
Powell Supply Co.	2119 Farnam St., Omaha, Neb.
Polson Bros.	1426 Grand Ave., Kansas City, Mo.
Story Motor Supply Co.	Bozeman, Mont.
Motor Sales Co.	409 South Fifth St., Minneapolis, Minn.
Empire Auto Repair Co.	1307 S. Wabash Ave. (Rear), Chicago, Ill.
A. F. Young	Charlevoix, Mich.
J. P. Van Vorst	904 Main St., Houston, Tex.
Bernin Auto Co.	933-935 Perdido St., New Orleans, La.
Local Auto Repair Co.	3032 Market St., St. Louis, Mo.
Bummiller-Remellin Co.	432 Main St., Cincinnati, Ohio
L. A. Alexander	93 Massachusetts Ave., Boston, Mass.
Buckley & Burton	103 Bradford St., Providence, R. I.
Breen Motor Co.	Broadway & Sherbrooke Sts., Winnipeg, Man., Canada
G. Saloschin & Cie.	Ave. Juarez, Mexico, D. F.

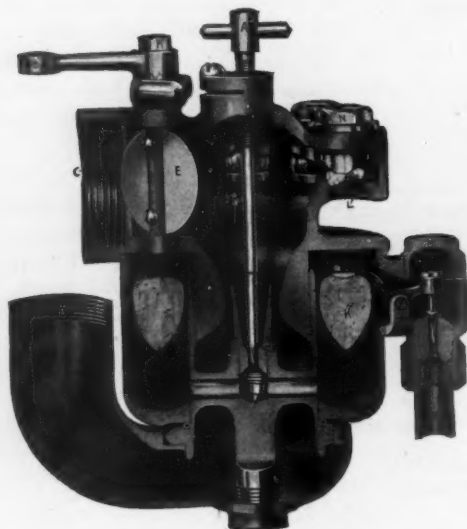


When Writing to Advertisers Please Mention Motor Age.

# KINGSTON

Floating Ball - Single Adjustment

# CARBURETOR



**A**S opposed to other Carburetors with their hundreds of combinations of several adjusting screws and their innumerable mechanical intricacies, the KINGSTON standards forth as a **perfect** carburetor built in a **simple** way.

Nothing appeals more to the mechanical common sense of the motorist than this simple, economical, trouble saving construction of the KINGSTON.

Everybody appreciates the invariable accuracy of a ball valve. Scientists and engineers the world over use it in the construction of instruments which are useless unless they are accurate. Upon this floating ball principle the economy, power and reliability of the KINGSTON Carburetor depends. Five floating bronze ball valves regulate the auxiliary air supply, reliably and invariably give the proper mixture in the proper proportion for every motor speed under every possible condition of road and weather.

May we further demonstrate to you other features and advantages?

Made by the Oldest Manufacturers of Carburetors in America  
ESTABLISHED 1895

**Byrne, Kingston & Company, Kokomo, Indiana**

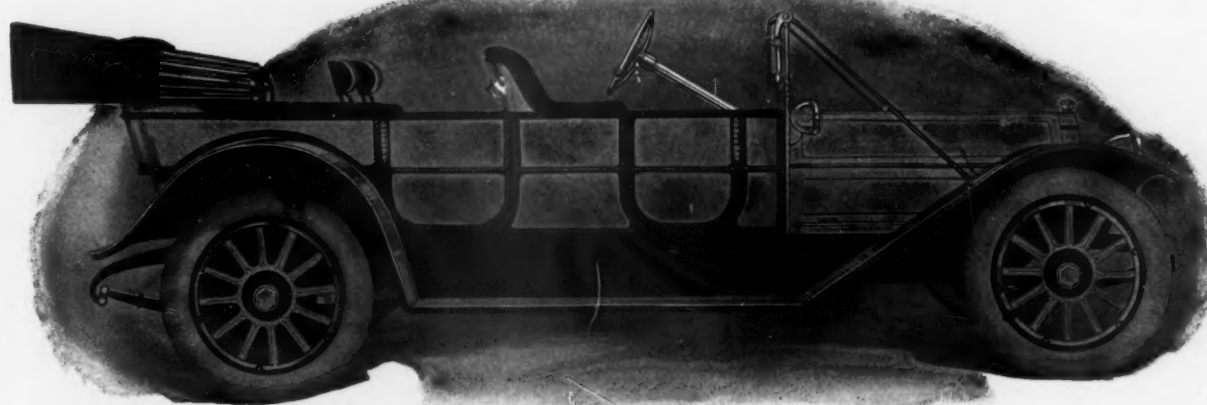
BRANCHES

W. E. KEMP, 1733 Broadway, New York, N. Y. F. J. ALVIN, 650 Woodward Ave., Detroit, Mich.  
MARK B. FALVEY, 1430 Michigan Ave., Chicago, Ill.



# **"77" AUSTIN "77"**

## **Some of the Distinctive Features**



**MOTOR** Six cylinders,  $4\frac{1}{2}$  inch bore, 7 inch stroke.

**SELF STARTER** High pressure air system, having a special air pump maintaining 150 lbs. pressure in a large tank from which there is also a connection for instantly filling tires with pure air.

**IGNITION** Two sets of spark plugs, new double combination system, firing each set separate or both sets simultaneously.

**LEFT HAND STEER** With right hand center control, giving a much quicker view of the road ahead when passing any vehicle, and allowing the use of both front doors.

**TRANSMISSION** Selective type. Four forward speeds. The center control lever is very short and has a ball and socket joint at the floor connection, eliminating all holes or slots in the floor. The segment and also the clutch interlocking device are absolutely positive and are entirely enclosed in the transmission case.

**REAR SPRINGS** Three-quarter elliptic, 60 inches long.

**CUSHION SPRINGS** Entirely new double construction. Exceedingly soft and flexible, and still very strong and durable.

**BOTH BRAKES ARE CONTROLLED BY FOOT PEDALS** A slight movement of the clutch pedal entirely releases the clutch and at the same time takes up the slack of the emergency brake which is fully engaged by a further movement of the clutch pedal. The service brakes are also operated by a foot pedal. This arrangement eliminates the hand brake lever and enables the operator to handle both clutch and brake with one foot when desired, leaving the other foot free to operate either the exhaust horn or accelerator. Also, both brakes can be applied instantly without taking either hand from the wheel.

**ELECTRIC LIGHTING** "Leece-Neville" Generator, furnishing 20 amperes at moderate speed. 32 c. p. Head Lights, 16 c. p. Side Lights and 4 c. p. Tail Light. A combination switch controlling all lights, as desired, including a dimmer for the head lights. Edison Storage Battery.

**Price \$6000.00**

Write for descriptive circular showing many more New, Improved and Special Features

Model "45"  
6 Cylinders.  $43\frac{3}{8} \times 5\frac{1}{4}$   
\$3600.00

Write for Our Special  
Agency Proposition

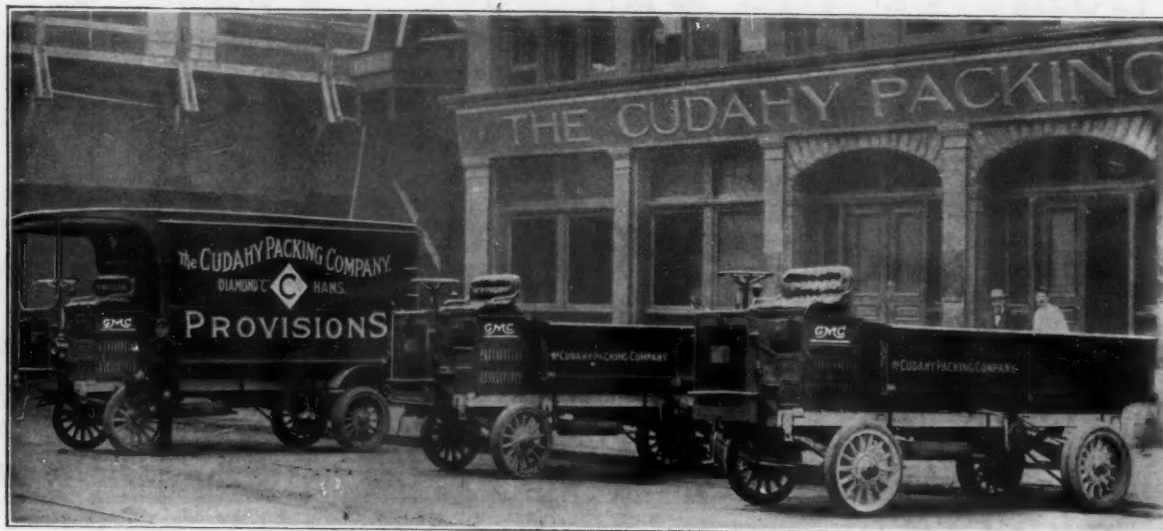
Model "50"  
6 Cylinders.  $4\frac{1}{2} \times 6$   
\$4400.00

# **AUSTIN AUTOMOBILE COMPANY**

## **GRAND RAPIDS, MICHIGAN**



## Examples of Efficiency



### Here are two notable examples of motor truck efficiency:

The Cudahy Packing Company have used General Motors Trucks of  $3\frac{1}{2}$  ton capacities for years. The initial equipment, four in number, were installed at Philadelphia. In a communication recently received by us, the Cudahy Company says: "We have plenty of work for the trucks at this point and they have never been out of service since received, and have given us perfect satisfaction. We appreciate the instructions your local branch has given our green drivers and we are exceedingly pleased with the all-around treatment and performance of the trucks."

In December of last year the Cudahy Company placed an order for two more trucks of the same

capacity, so well pleased were they with the work done by the first ones purchased.

The Passaic Ice Company of Paterson, N. J., have had remarkable success with a five-ton GMC Truck. It has been in use every day for two years, covering its route daily ten to twelve times and hauling a total of sixty tons each day.

They have been so well pleased with the performance of this truck that they have decided to abandon entirely their horse equipment and the beginning of the season will find them with a complete motor delivery system.

General Motors Truck Co. produces both gasoline and electric trucks and in standard capacities, ranging from 1000 lbs. to 6 tons. *It can thus supply any delivery need, without bias as to size or power.* Send for either gasoline or electric truck catalogs—or both.

*Correspondence from prospective purchasers and dealers is invited.*



**GENERAL MOTORS TRUCK COMPANY**



COMPLETE  
INSTALLATIONS

New York  
Chicago  
Boston

**DETROIT**  
Michigan

Philadelphia  
Kansas City  
Detroit



COMPLETE  
SERVICE

*When Writing to Advertisers, Please Mention Motor Age.*





Model 27—Five-Passenger Light Torpedo, \$1,250. With Top and Windshield, \$1,350.

## The Elmore Valveless Motor Gives You More Continuous Power Than Other Engines

**Y**OU'VE read a good deal about continuous power impulses in an automobile engine—what is known technically as continuous torque.

Of course it's easy to understand that the more the power impulses of the engine overlap, the smoother and more economically the car will run. And the less the power impulses overlap, the more jerky the car-movement will be, and the more fuel it will use.

Now, in the ordinary 4-cylinder engine, only every fourth stroke of the piston has power behind it. Out of sixteen piston-strokes making up one complete operation of the four cylinders, there are four power-strokes. That is far from continuous power-impulse and far from smooth-running.

Makers of six-cylinder cars have dwelt strongly on this fact, showing the greater overlap of power in a six-cylinder engine and the consequent greater smoothness of operation. And their argument is sound.

But in the six-cylinder engine it is still true that only every fourth impulse is a power-impulse—six in all to each complete operation of the engine.

In the Elmore valveless motor, every other impulse is a power impulse—eight power-impulses out of every complete operation of the engine.

***In other words, a four-cylinder Elmore Valveless Motor will develop more continuous power than any six-cylinder poppet-valve engine, with consequent greater ease and efficiency.***

### What Valveless Construction Means to You

Valve troubles cause ninety per cent of motor-car inefficiency. There are from 20 to 40 small parts on each valve of the ordinary engine—or from 80 to 160 parts on 4 cylinders. Unless all these parts work in almost perfect co-ordination—within a small fraction of a second—the cylinder begins to miss fire and ultimately stops altogether. Valve adjustments and repairs make up a large portion of upkeep expense—every motorist knows it. But the Elmore owner never has such items to pay, nor such annoyances to meet.

### The One Proven Successful Valveless Motor

The Elmore motor has been in successful operation over American roads for over a dozen years. There are thousands of Elmore owners, everywhere. And any one of them will tell you that for economy, efficiency and ease of operation the Elmore is in a class of its own. But it is well to remember that the Elmore alone can show such a long record and service; and the features which make the Elmore valveless construction valuable are patented and exclusive.

### A Model for Every Motoring Need

Whatever your desire in the way of a car, there is an Elmore which will meet your utmost requirements. We use the best materials, the highest grade of workmanship obtainable. In fact, Elmore construction is a synonym for quality in the industry.

And the price range—\$1050 to \$1850—is most conservative.

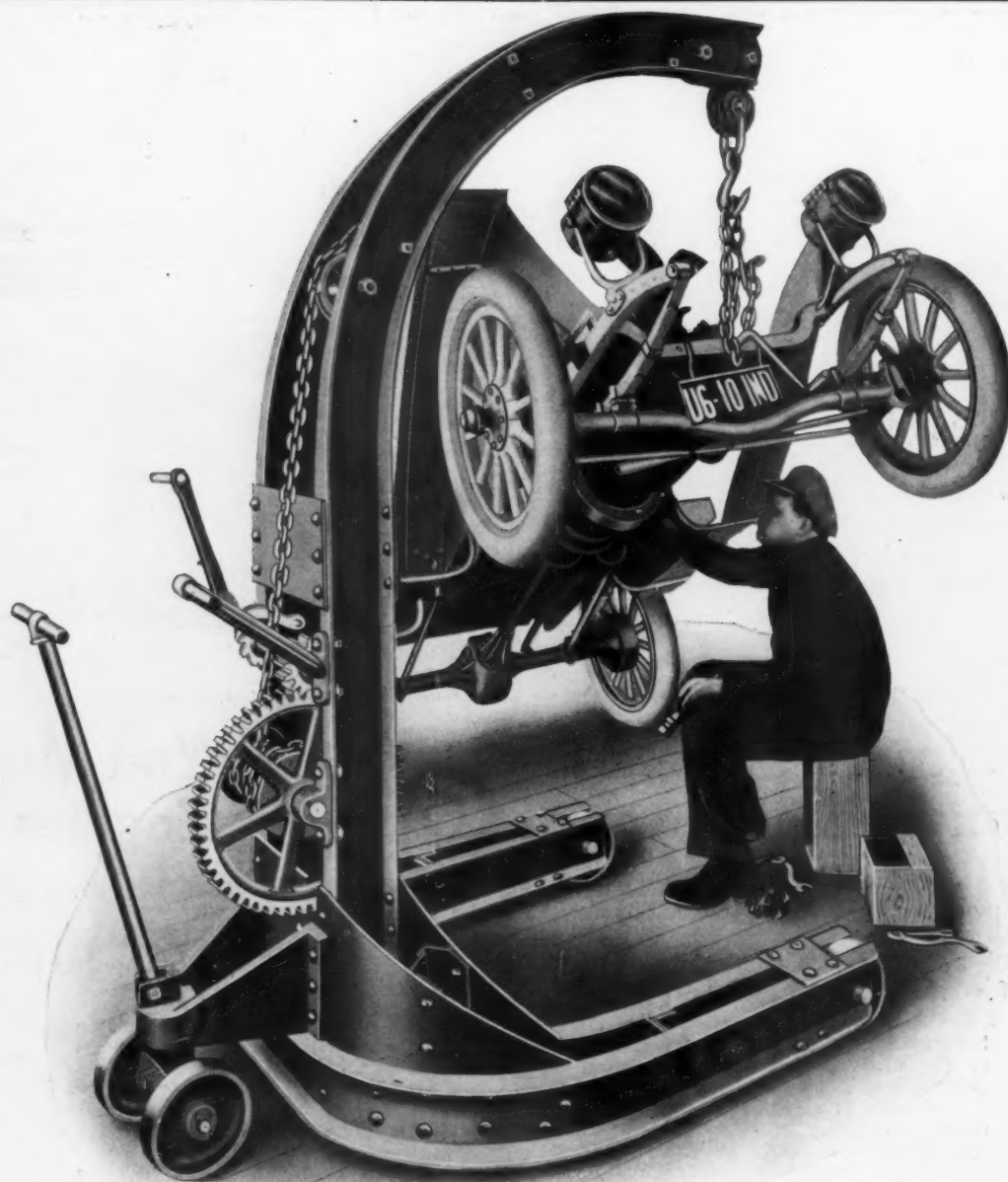
Write for interesting free booklet and we'll tell you where to see the car.

**THE ELMORE MANUFACTURING COMPANY,**

**Factory, Clyde, Ohio**

Address all communications to

**GENERAL SALES OFFICE 85 Congress Street East  
DETROIT, MICHIGAN**



THE PORTABLE GARAGE CRANE MAKES WORK EASY

## THE PORTABLE STEEL GARAGE CRANE

A PORTABLE STEEL GARAGE CRANE will pay for itself out of the time and labor it saves the garage owner. One man in two minutes with this crane can place a car in the position shown in the illustration above. What is more, he can do it without effort. One man with this crane can do anything necessary with any automobile, do it without help, and do it in a fraction of the time required by the old tugging, straining methods.

One man can handle the largest automobile with the greatest ease. He can lift and carry off any body. Unaided, he can lift out the engine or lift all four wheels off the floor for change of tires. In fact, one man with a PORTABLE STEEL GARAGE CRANE can do the work of six men without it. And he can do that work better, quicker, and cheaper.

No garage equipment is complete without a PORTABLE STEEL GARAGE CRANE.

Price F. O. B. \$100

Write for Discount

**THE LAFAYETTE ENGINEERING CO., Lafayette, Ind.**

(3)



## Hartford Pointers—No. 3

# Reduced Depreciation—and Easy Riding

**W**HY is it that often one car will command a far better price on second sale than another of the same make and model—even though the first has seen longer and more severe service?

Better care—there's the reason.

No factor is more destructive to the motor and mechanism than the ravaging jolt, jar and vibration incurred on rough, tortuous roads.

You cannot avoid rough roads and get anywhere, but you *can* avoid the jolt, jar and vibration. And in so doing, you are materially adding to the life of the whole car and to its market value. The

## **Truffault-Hartford**

### **SHOCK ABSORBER**

points the way. Experts declare that it reduces depreciation 50%. This alone should commend its use to every prudent car owner. But there are further advantages in using this equipment—advantages in comfort, safety and economical up-keep—advantages of enough consequence to more than double the pleasure of motoring and effect a large reduction in up-keep costs.

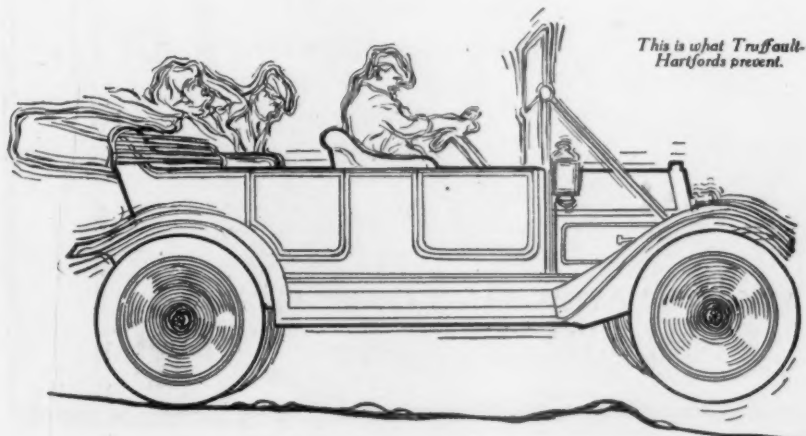
The spring plays a very important part in the performance of the car. If allowed to operate without proper restraint, it acts violently. It isn't natural that your car should pound down on its axles when it encounters a road obstruction, then rebound with distressing fury. Nor is it reasonable that the tires, engine and frame can long endure this abuse. The logical thing to do is to provide against it, and the one logical provision is the Truffault-Hartford Shock Absorber—the only device exercising *proper* control over spring action.

Proper control, in brief, means this—a steady, constant frictional resistance to *both* the contraction and expansion of the spring—enough resistance to always keep the spring within its normal working limits, but *not* enough to interfere with the *full play* that is necessary to secure easy riding.

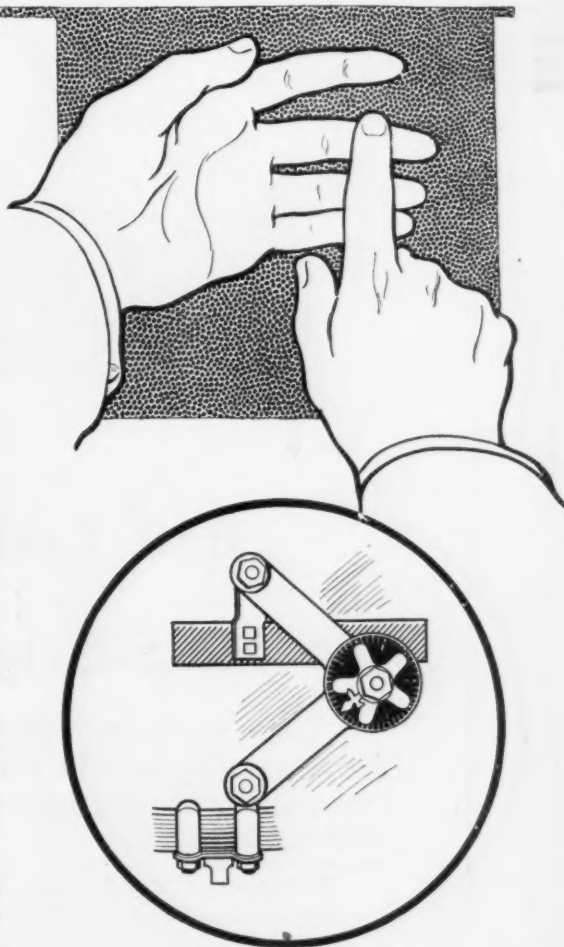
This exclusive feature of the Truffault-Hartford accounts for its ability to completely absorb all road shocks without detracting from the flexibility of the spring. It is the reason for its efficiency in preventing spring breakage—in reducing tire, up-keep cost, and depreciation by one-half—and in making your car sumptuously easy to ride in on all kinds of roads.

*Twenty-four leading automobile manufacturers equip every car they produce with the Truffault-Hartford.*

Four Models—\$60, \$45, \$25, \$15.



When Writing to Advertisers, Please Mention Motor Age.



Your dealer will be glad to tell you more about the Truffault-Hartford—and our new catalogue will also acquaint you with its many additional features. Write for it today.

### **The Hartford Suspension Co.**

E. V. HARTFORD, Pres.

144 Bay Street Jersey City, N. J.

#### **BRANCHES**

NEW YORK	- 1700 Broadway and 212-214 West 88th St.
BOSTON	- - - 325 Columbus Avenue
PHILADELPHIA	- - - 1437 Vine Street
CHICAGO	- - - 1458 Michigan Avenue
NEWARK	- - - 289 Halsey Street
KANSAS CITY, MO.	- - - 1524 Grand Avenue
DETROIT	- - - 870 Woodward Avenue

#### **15 Years "Weeding Out" the Inefficient.**

Since 1897 when we conceived the idea of the shock absorber (six years before the device was presented to the public at large) we have "weeded out" by costly experimenting, year after year, numerous other devices, including the wedge, cam, hydraulic, air-cylinder, strap, spring, spiral spring and spring cylinder, etc. We have proved conclusively—that, so far at least, no other principle than rotary friction has come anywhere near to solving the shock absorber problem and this is mentioned that the public may take advantage of the knowledge gained at great expense during a period of 15 years.



Detroit Electric Coupe  
Equipped with  
Hess-Bright Ball Bearings  
throughout  
except in front hubs

## Ball Bearings In General but Hess-Brights In Particular

There are many reasons why annular ball bearings are selected for responsible duty in a high grade car. There are certain special reasons why the bearings most often selected for the best cars are HESS-BRIGHTS.

No type of anti-friction bearings is so free from internal friction as the properly made annular ball bearing. Friction involves wear, and the most frictionless bearing wears least and endures longest.

Other types of bearings may serve in cars not intended for especially long service: but pick a car with a marked reputation for durability, and ten to one you will find that it has

### HESS-BRIGHT BALL BEARINGS

Built for Endurance

These bearings are distinguished by deep race grooves and by the absence of side slots in the races. They continue to run and give good service long after bearings lacking these two vital features would have to be discarded on account of looseness or hammering of the balls. In addition, they do not require to be fitted with extreme tightness. This is an advantage, since it enables them to yield with the elasticity of the shaft and supporting parts.

Inquire the name of the ball bearings in the car you rank the highest. The answer will usually be "HESS-BRIGHTS." The reason? It is told in our booklet, "Ball Bearings that Endure." Write your name and address on the margin of this advertisement and mail to us. A copy of the booklet will reach you by return mail.

**THE HESS-BRIGHT MANUFACTURING COMPANY**  
2105 Fairmount Avenue, Philadelphia, Pa.



Best insurance  
against a  
soaking

# Jiffy

CURTAINS

Operate entirely  
from the  
inside

## Sudden Showers Have No Terrors If Your Car Is Jiffy-Curtained

Ever spend precious minutes in a pouring rain trying to put up curtains that wouldn't stay put?

Ever watch the smile of patient resignation on the faces of the ladies of the party as their costumes were drenched?

Well, never again.

Put Jiffy curtains on your car. Start adjusting them with the fall of the first rain-drop—you'll have the car snugly enclosed before the drop reaches the ground.

Shower over—you can have them up and out of the way just as quickly.

And listen!

A good many manufacturers—the wise ones, the ones that are always looking for opportunities to give you better service—will furnish Jiffy curtains as part of their regular equipment on 1913 models.

You can have them on your new car, if you insist.

Come on in out of the wet, and insist.

### PRICES

<b>Roadster</b>	
Rubber.....	\$15.00
Mohair or Pantasote...	20.00
<b>Five Passenger</b>	
Rubber.....	\$25.00
Mohair or Pantasote...	30.00
<b>Seven Passenger</b>	
Rubber.....	\$30.00
Mohair or Pantasote...	35.00

### TOP MANUFACTURERS

For lots of money in a Jiffy, write for our special royalty license proposition.

**JIFFY AUTO CURTAIN COMPANY**  
1505 Michigan Avenue, Chicago



When Writing to Advertisers, Please Mention Motor Age.



## Why not change places with your customers on this tire question?

It might be a good thing for tire dealers to get on the other side of the counter once in a while and look at things from the viewpoint of the customer.

If you were *buying* tires instead of selling, what tires would you buy?

The ones that offered you the greatest tire value for the money, wouldn't you? And you undoubtedly would let the number of strong points incorporated in the tire determine its value.

When you found a tire that "stood up"—gave you a service return for every penny of your investment—you probably would tell your neighbor that your dealer sold *Good* tires. And your dealer would get another customer and his business would grow accordingly.

Why not *sell* the kind of tires you would buy if you were a customer?

## United States Tires

They are the product of a four-fold system of manufacture.

They combine the strong points of *Four* world-famous brands of tires.

They are the *Strongest Tires in the World*.

Why not handle them?

### UNITED STATES TIRE COMPANY

New York

*Dealers Everywhere. No Goods at Retail*





**THIS MAN IS NOT CRAZY**  
 He Just Cranked His Car by Hand  
 And Did Not Know the Clutch Was In  
*Use an* **ELECTRIC SELF-CRANKER**  
 WITH AN



(CLASS B)

# Electric Cranking Battery

Class B Batteries are for ELECTRIC SELF-CRANKING

Class A Batteries are for ELECTRIC LIGHTING

With an ELECTRIC SELF-CRANKER you can easily have ELECTRIC LIGHTS

WRITE US FOR FULL INFORMATION

**WILLARD STORAGE BATTERY COMPANY**  
**CLEVELAND, OHIO**

NEW YORK BRANCH: 136 W. 52nd St.

DETROIT BRANCH: 1191 Woodward Ave.

CHICAGO BRANCH: 436 So. Dearborn St.

Agencies in all Principal Cities in the United States and Canada

*When Writing to Advertisers, Please Mention Motor Age.*



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### UNITED STATES TIRE COMPANY

New York

*Dealers Everywhere, No Goods at Retail*





## THIS MAN IS NOT CRAZY

He Just Cranked His Car by Hand

And Did Not Know the Clutch Was In

Use an **ELECTRIC SELF-CRANKER**

WITH AN



(CLASS B)

## Electric Cranking Battery

Class B Batteries are for ELECTRIC SELF-CRANKING

Class A Batteries are for ELECTRIC LIGHTING

With an ELECTRIC SELF-CRANKER you can easily have ELECTRIC LIGHTS

WRITE US FOR FULL INFORMATION

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## Issued in Five Volumes for the Season of 1912

- I. New York State and Canada
- II. New England and Maritime Provinces
- III. Pennsylvania, New Jersey and the South
- IV. The Middle West.
- V. Mississippi River to the Pacific Coast

**30,000 Miles of Entirely New  
Routes for the Motorist**

**Dealers Should Place Their 1912 Orders  
at Once to Insure Early Delivery**

**T**HE Official Automobile Blue Books are entering upon the greatest year in their history.

A new volume, **Number 5**, has been added, to cover the extreme West.

**Blue Book** cars have covered 30,000 miles of absolutely new territory, rich in scenic and historic interest, since the 1911 edition.

The largest distributors in America have increased their 1912 Blue Book order 700% over last year.

We urge all dealers to write for our sales-plan, discounts, etc.

Not only can you make it one of the most profitable items in your stock, but the **Blue Books** bring the best trade of your locality into your store.

*Address at once for circulars, display cards, etc.*

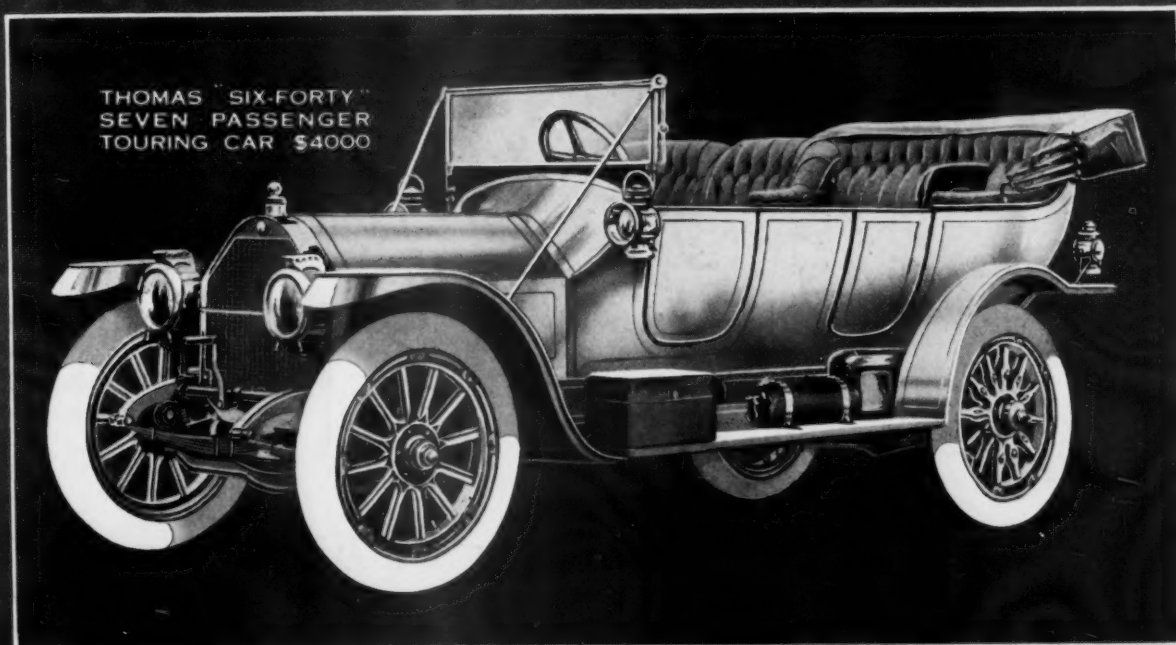
**The Automobile Blue Book Publishing Company**

**2160 Broadway  
NEW YORK**

**908 S. Michigan Ave.  
CHICAGO**



# The 1912 Thomas "Six-Forty"



One year ago an announcement was made that a complete new organization had taken over the management of the Thomas Plant at Buffalo. The production of the 1912 Thomas "Six-Forty," its performance in the hands of owners and comment of the most favorable kind by the press and public at the leading automobile shows is the evidence offered to prove that a car of the very highest type can be and has been produced to sell at \$4,000.

Four styles of open bodies    The Touring Car  
The Phaeton    The Surrey    The Runabout

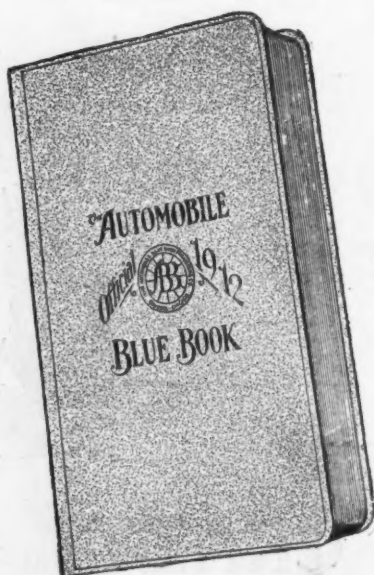


## THOMAS DECLARATIONS No. 7

*We assert that the 1912 Thomas 3 disc Clutch enables the operator to make an easier engagement and ensures a more positive drive than any other type or kind of clutch in use at the present time.*

Our Catalog - "The Story of the Thomas" awaits your request.

E. R. THOMAS MOTOR CAR COMPANY, DEPT. D.      BUFFALO



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- I. New York State and Canada
- II. New England and Maritime Provinces
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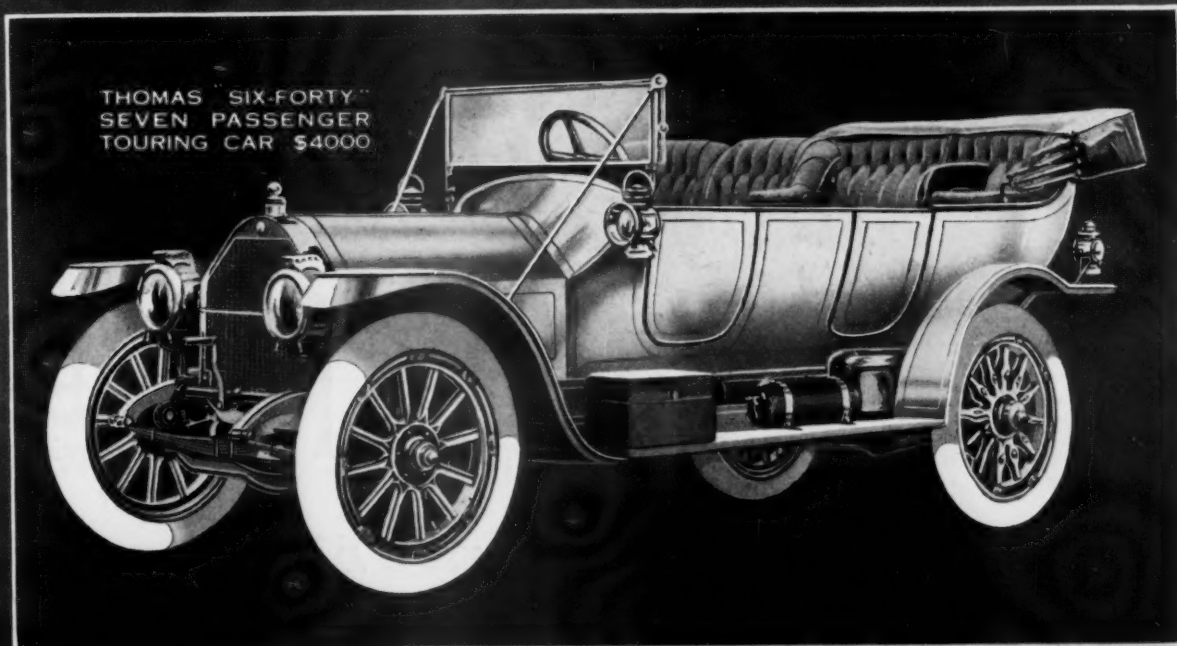
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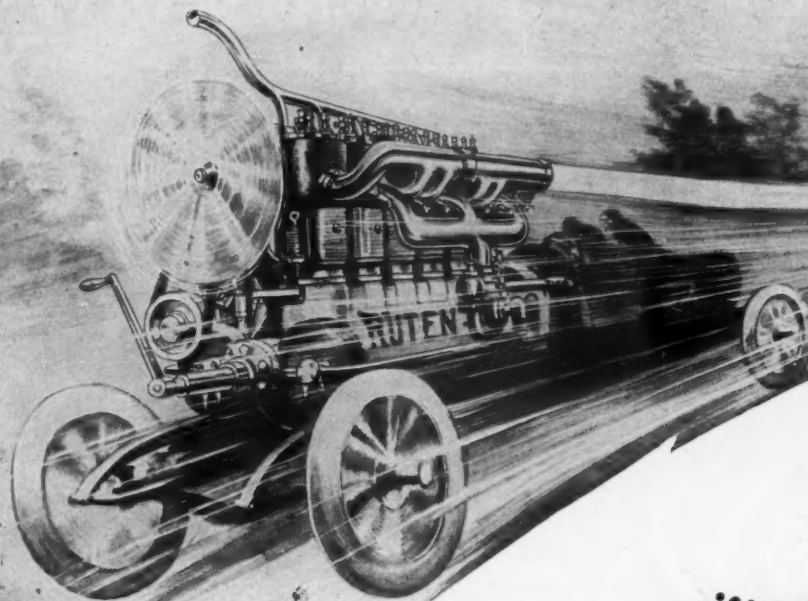


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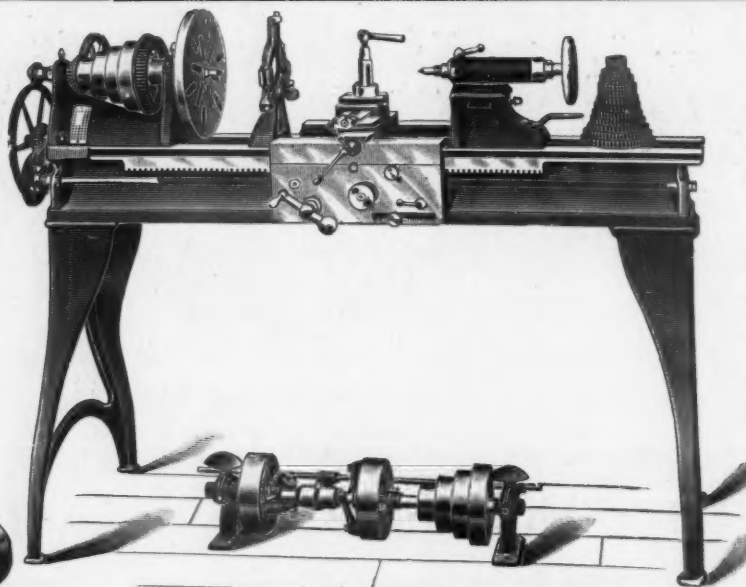


If it's a  
**RUTEMBER**  
MOTOR

*give him the road.*

Our booklet, "Satisfaction Under the Hood," for the asking. Write for it.

THE WESTERN MOTOR COMPANY, - Marion, Indiana



## NO. 13 LATHE

Bed	Centers	List Prices
5 ft.	33 in.	\$167.00
6 ft.	45 in.	177.00
7 ft.	57 in.	187.00
8 ft.	69 in.	197.00

This lathe swings 13 inches on face plate, has automatic cross feed, compound rest and countershaft, cuts right or left-hand threads. A 6-foot lathe weighs about 850 pounds.

**For Garage REPAIR WORK** we offer the following outfit:—

FOR  
**\$250.00 CASH**  
F. O. B. CARS ROCKFORD  
 { A Barnes No. 1, 20 in. swing Drill (square base, combined lever and wheel feed).  
 A Barnes No. 13 Lathe, 6 foot bed with countershaft.  
 A 9-inch Cushman Independent 4-Jawed Chuck.  
 A Set (9) Lathe Tools.  
 A No. 2 Little Giant Drill Chuck for Barnes Drill.

Send Cash with Order  
and refer to this  
Advertisement

P. S.—If you want longer than 6 foot lathe bed, add \$10.00 per foot—

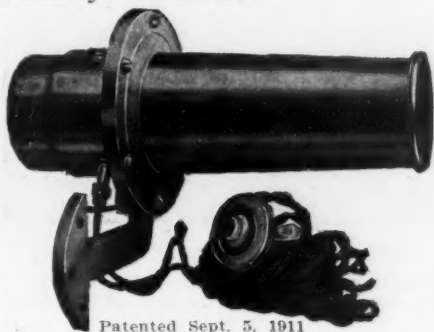
**W. F. & JOHN BARNES CO.,** 444 Ruby St., Rockford, Ill.



# THE NEWTONE MOTOR HORN

## "The Mile-Away Motor Horn"

A TOUCH OF THE BUTTON—The danger note produced is powerful and abrupt; the tone, penetrating and melodious—that rasping sound, so distasteful to the refined motorist, is entirely eliminated.



Patented Sept. 5, 1911

**NEWTONE TORPEDO HORN**  
(Guaranteed for One Year)

**PRICE \$20.00**

Complete, including  
Button and Cable

### MANUFACTURED

and guaranteed by a firm which for the past eight years has made and is still making over 80 per cent of Automobile Horns now in use in the United States.

## Thousands Upon Thousands of Newtone Motor Horns Sold

The new electric motor which operates the Newton is the real secret of its superior efficiency and economy of operation. The fields of the new motor are made up of 75 very thin discs of special steel, thoroughly insulated. This new field construction produces more power, with practically 50% less current consumption of any other horn in this class.

The shaft of the Newton motor runs on Hess Bright ball bearings, eliminating all friction and greatly saving power.

The motor is equipped with imported, self-lubricating brushes, dispensing with all oiling and cleaning of the motor.

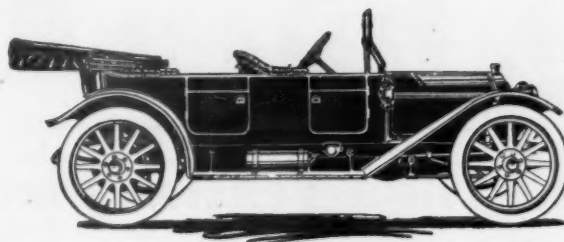
The diaphragm is of vanadium steel, made rust-proof by a special process.

*The Chief Engineers of three leading American Automobile Manufacturers after a "Break-Down" Test stated that in their opinion, the Newton is the BEST warning signal made.*

**Automobile Supply Manufacturing Co.**

220 TAAFFE PLACE, BROOKLYN, N. Y.

# Marathon



**MARATHON MODEL "L" TOURING CAR**  
**116-inch Wheelbase—Complete Equipment—\$1200**

The Car that outclasses its price almost two to one—Unit power plant of full 30 horsepower—116-inch wheelbase—34x3½-inch tires—Multiple disc clutch—three-speed selective transmission—Complete Equipment—Ten Models—\$685 to \$3250.

IF YOU WANT THE LIVEST LINE IN THE COUNTRY TO HANDLE FOR  
NEXT YEAR, WRITE AT ONCE. SOME GOOD TERRITORY STILL OPEN

**Marathon Motor Works** 1204 Clinton St. **Nashville, Tenn.**

## THE NEVER MISS AUTO STARTER

Starts any car regardless of size. Starts perfectly on magneto or battery. Only one touch of foot on button required. Tested **22,000** starts without **ONE MISS**. Has never made one failure to start. Neat, compact, durable, fool proof. Nothing to break or get out of order. Starts motor easily without jar or shock. Noiseless, simple "Semper Paratus." Attachable to any make of car. One starter will outwear three new cars.

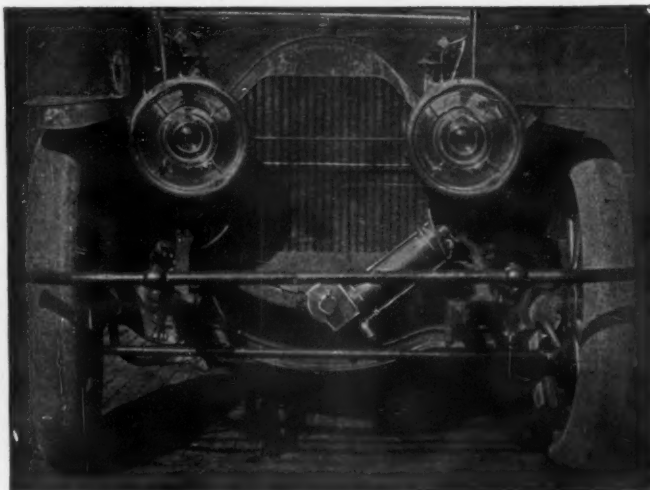
You are pleased at the beginning and your delight increases daily. Our air supply system is so perfect that tests of an idle car can show no change in pressure after three months' standing with full pressure on all connections. No broken arms, or ruptured men. Under "Employers' Liability Law" owner of crank-starting car is liable for injury to driver. Small compound air-pump fills tank to 300 lbs. pressure in eighteen minutes. One tank of air starts large car 35 times, and small car 40 times. Air tank will fill four of the largest tires in less than two minutes each. This starter is not claimed to cure faults of carburetor or mechanical defects, but it will start any car that it is possible to start with crank, and when it does not start the motor you may be sure the fault is not in the starter.

A lady, with this starter, can operate a gasoline Runabout car as easily as she now handles an Electric Motor Car.

PATENTEE  
GRIGG J. SPOHRER

WILSON MOTOR STARTER CO., Franklin, Pa.

PRICE \$200 NET, F. O. B. Franklin, Pa.



STARTER SHOWN IS ON 60 H. P. CAR.

When starters are placed on car by the manufacturers of the car we give a warranty good for one year against all breakage in ordinary usage.

No builders of American or foreign cars have in any parts of their car better construction or workmanship. When you have once seen it working you will recognize that it is no "gim-crack" or toy, but a positive, potential, perfect, **NEVER MISS STARTER**; hot engine, cold engine, or magneto or battery; on a 90 H. P. car, or on a 20 H. P. car; makes no difference. It is a **NEVER MISS PROPOSITION**; requiring no excuses, offering no apologies.

Ask any user and you find a delighted individual.

YOU touch the button, **WE** do the rest.

JOHN A. WILSON,  
President

# PITTSFIELD

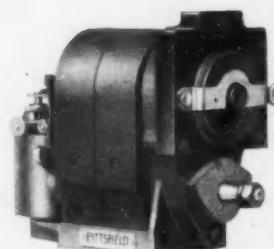
## True High Tension Magneto

Most Efficient Sparks at Lowest Speeds

**A** TRIUMPH in magneto making, the new Pittsfield Perfected Magneto has tremendous power and is simple, strong, efficient, dependable and durable. There are no moving wires on the armature. Retarded spark is as effective as advanced. No danger of kick-back. The Pittsfield Engine Starter is a compact little device used in connection with our magneto and starts the motor by simply pressing a button. Those who have Pittsfield ignition equipments are not annoyed with ignition troubles.

PITTSFIELD SPARK COIL CO., Dalton, Mass.

SALES REPRESENTATIVES—\*New England States, William J. Connell, 555 Boylston St., Boston, Mass. Atlantic States, Thomas J. Wetzel, 17 W. 42nd St., New York City. \*Central States, Brown & Caine, 1517 Michigan, Ave., Chicago, Ill. \*Pacific States, Chanslor & Lyon Motor Supply Co., San Francisco, Los Angeles and Fresno, Cal., Seattle and Spokane, Wash., Portland, Ore. \*Canada, Russell Motor Car Co., West Toronto, Canada. \*Full line carried.



TYPE NB

Catalog  
of the Entire  
Pittsfield Ignition Line on Request.



## Salisbury Wheel and Manufacturing Company

and its allied corporations who are prepared to manufacture and make prompt deliveries of materials classified as follows:

**SALISBURY WHEEL & MANUFACTURING COMPANY**  
JAMESTOWN, N. Y.

Shaft Drive Rear Axles. Propeller Shafts.  
Jack Shafts for Commercial Vehicles up to 2000 lbs.  
Hubs and Wheels.

**PERU AUTO PARTS MFG. CO.**  
PERU, IND.

Light Shaft Driven Rear Axles.  
Transmissions, Selective and Planetary types.  
Roller Bearings (our own design).

**GREENVILLE METAL PRODUCTS CO.**  
GREENVILLE, PA.

Front Axles—"I" Beam or Tubular.  
Chain Driven Rear Axles and Jack Shafts.  
Complete Commercial Vehicle Chassis.

ALL CORRESPONDENCE ADDRESSED TO

S. H. PENFIELD, General Sales Manager, Jamestown, N. Y.

## Welding new rubber into a stone cut with a

## SHALER Vulcanizer

*"The permanent tire repair"*

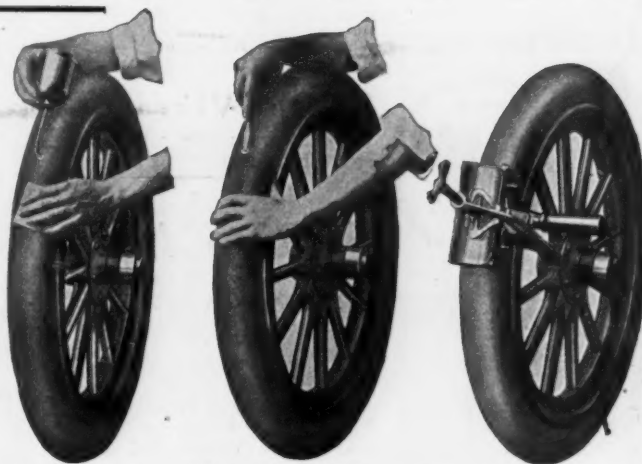
Every time you repair a cut or tear in a casing you insure yourself against the inconvenience, expense and danger of a blow-out. Unless a permanent repair is made by vulcanizing, dirt will work in between tread and fabric, weakening the tire until a blow-out occurs.

The Shaler Way is actually the simplest method of repairing tubes and casings. When a repair is vulcanized it is a part of the tire, not stuck on the outside. You or your chauffeur can use a Shaler Vulcanizer without any experience. We guarantee that. If you want to prove it at our risk, ask us about our 10-day trial offer.

Valuable Book of Tire Information Upon Request

"Care and Repair of Tires" was written by a motorist to save you trouble and expense. Contains emergency repair hints, descriptions of all of the approved tire-saving devices, and a description of Shaler Vulcanizers. Ask for your copy today.

**C. A. SHALER CO., 216 Fourth Street, Waupun, Wis.**

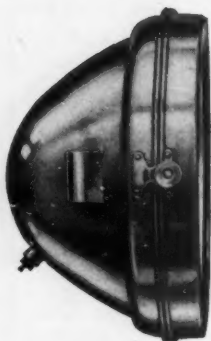


**You do it this way**

First you clean the injury with gasoline, just as if you were going to put on a cemented patch. Then roughen the rubber with sandpaper. Anyone can do that. Then smear on a coating of vulcanizing cement and after it has dried for a moment, fill the cut level full of scraps of Para rubber, furnished with the outfit. No chance for a mistake so far.

By this time the vulcanizer, which has been heating, is ready to go to work and you clamp it on the tire for a few minutes. The temperature is controlled automatically so you don't need to think about it until the repair is done. Absolutely simple, yet perhaps you didn't know that you could vulcanize just as well as an expert.

## Light Your Headlights by Electricity



The K-W Outfits manufactured for this purpose are not makeshifts, but are complete in every detail.

The Outfit complete, which is all you need, consists of:

- 1 pair complete Head Lamps.
- 2 Tungsten Bulbs. Size of Bulb, 2 1/16 in. diameter.
- 12 feet Wire, all soldered to lamps.
- 1 Diamond switch.
- Instruction Sheet for Wiring.

Choice of either Straight Body or Bullet-shaped Lamps

**THE SUCCESSOR TO THE GAS TANK  
CURRENT DIRECT FROM MAGNETO**

**For Ford Cars, with fly-wheel Magneto \$15**

**For Any Other Car, \$50**

This outfit is the same as our \$15.00 Ford Lighting Outfit with the addition of a \$35.00 Low-Tension K-W Magneto, which can be mounted on almost any car to run the lights.

**THE SIMPLEST ELECTRIC LIGHT OUTFIT IN  
THE WORLD**

NO Storage Battery to Sulphate or Short Circuit.  
NO Commutator or Brushes to make trouble.  
NO Complicated Cut Out to go wrong.  
NO Delicate Ammeter or Voltmeter.  
NO Difficult Electrical Connections.

**WE PAY THE EXPRESS** east of the Mississippi River or to the Mississippi on points beyond on any of our goods, when cash accompanies the order.



**Master Vibrator**  
for all cars using vibrating  
spark coils and **ESPECIALLY**  
**FOR**

**FORD CARS**

You will never know how much  
**SPEED, POWER AND  
FLEXIBILITY**

there is to your Ford car until  
you install a K-W Master Vi-  
brator.

The K-W Master Vibrator does  
away with the separate vibrator  
adjustment on your coil, giving  
you one fast vibrator and pow-  
erful condenser for all of them,  
thus giving absolute synchro-  
nism, with a smoother running  
engine. It makes the hills "fade  
away."

Try it thirty days and if you  
even feel that you can do with-  
out it, return it and get your  
money.

PRICE, \$15.00

Express Prepaid When Cash Accompanies the Order

We also make Magnetos and Spark Coils

Write for catalogue 17  
**THE K-W IGNITION CO.**  
2835 Chester Ave. CLEVELAND, OHIO, U.S.A.

No matter what your ignition troubles are, we have  
a guaranteed cure.

## You Can Have Electric Lights on Your New Car if You Specify Them

Every up-to-date automobile manufac-  
turer has tested and can furnish effi-  
cient dynamos and batteries and as to  
lamps, you will be **sure** of getting good  
service if you insist on having

## Guide Electric Lamps



We will on your request send a booklet  
called "The Truth About Automobile  
Lamps." It is the truth and when you  
have read it you will know why one  
lamp is better than another. You will  
also know how to take care of your  
lamps.

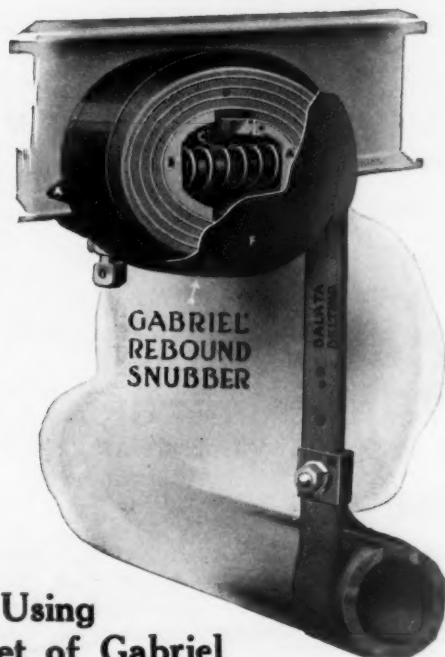
The book is free,  
shall we send it?

**Guide Motor Lamp Manufacturing Co.**  
East Fourth Street, Cleveland, Ohio

Their *Guide* Mark

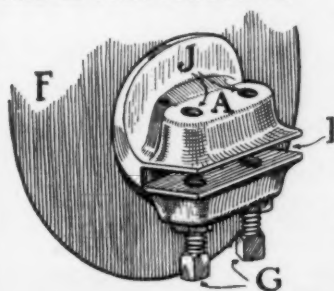


## Forget the Rough Spots



### By Using a Set of Gabriel REBOUND SNUBBERS

The most efficient and practical device ever produced for making the car ride easy, regardless of road conditions.



Easy to attach—does not rattle. Saves springs and tires.

Requires no adjustment and will outlast the car.

Sold at the Right Price and Fully  
Guaranteed

### SINGLE TUBE GABRIEL



There's no cheap, flimsy construction about the "Gabriel" Horn. It's the "Quality Signal" for the refined motorist.

SEND FOR CATALOG

**GABRIEL HORN MFG. COMPANY**  
1415 E. 40th ST., CLEVELAND, OHIO

Especially important advertisement. When answering it don't fail to mention Motor Age



### To the American Automobile Jury:

- 1—The first fabric ever made for automobile Tops was **Pantasote**.
- 2—The demand has increased surely—constantly—growing always, through all the years. This—
- 3—Because people found that **Pantasote** stays new.
- 4—Because of the glass-like finish that prevents oil and grease soaking in—that prevents stains. These wash off with soap and water as they do from the varnished sides of your car.
- 5—Because the inner layer of cementing gum that binds the outer fabric to the inner lining produces a cushion effect that prevents cracking from folding.
- 6—Because this cementing gum that lies between the fabrics binds the whole together for all time against snow and ice and rain and heat and cold and the wind's stress and the mechanical strains that Tops are always subjected to.
- 7—So you have a double protection in **Pantasote** both outside of and between the fabrics.
- 8—You get what Pullman cars have found the best and use exclusively—what all the railroads in the country have adopted for window curtains.
- 9—**Pantasote** is crack-proof, sun-proof, heat-proof, cold-proof, sleet-proof, snow-proof, rain-proof, oil-proof, grease-proof, dust-proof and dirt-proof.

The above is a brief summary of the evidence we offer. We do not fear the verdict.

### A Book For You

#### "The X-Ray on Automobile Tops"

The truth of how automobile coverings are made and what you get when you pay your money is practical information. Saves the expense of re-covering your automobile top—makes your car stay new-looking—gets you a higher price for your old car.

All these facts are in a small, neatly bound book, called "THE X-RAY ON AUTOMOBILE TOPS." It has a wealth of plain illustrations and live information.

Just write "X-Ray" on a postal and back comes your own book to you by first mail.

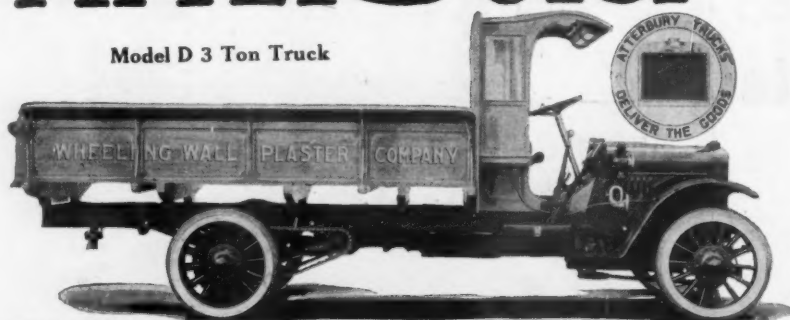
Now is the psychological moment. Put the "X-Ray" mark on a postal. Address,

**THE PANTASOTE COMPANY**  
442 Bowling Green Bldg. New York City

When Writing to Advertisers, Please Mention Motor Age.

# ATTERBURY TRUCKS

Model D 3 Ton Truck



## A Commercial Car for Every Purpose

The **ATTERBURY** complete line of commercial cars is designed and constructed to meet the demands of the business man on the market for a light delivery wagon as well as the requirements of the business which can utilize a fleet of three-ton trucks.

**ATTERBURY SERVICE** is always the same. **ATTERBURY EFFICIENCY** always the highest, no matter what the car, or its price.

**ATTERBURY** trucks will solve your delivery problems quickly, economically, and perfectly. Tell us your needs. Our experience will help you satisfy them. Write for catalog and information.

## ATTERBURY MOTOR CAR COMPANY

781 Hertel Avenue, Buffalo, N. Y.

Gasoline and Electric Cars, Motor Trucks, Hotel Omnibuses, Etc.

## Dependable Deliveries



**DELIVERY** dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries.

Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on seasons quantity specifications.

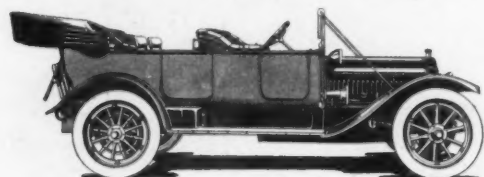
Philadelphia, Glenwood Av. and 2nd St.  
Detroit, 628 Ford Building

## Warner Gear Co.

Muncie - Indiana

## WHITE MOTOR CARS

ELECTRICALLY STARTED AND LIGHTED



**WHITE CARS** are equipped with a starting system that cranks the motor easily and naturally. There are no valves to leak, no gears to engage, and no explosions in the cylinders while the pistons are stationary. The White starting system is one hundred per cent efficient. Moreover, the lights are operated by the same system that starts the engine. Logical, isn't it?

"THE CAR THAT MADE LONG STROKE FAMOUS"

The White  Company

CLEVELAND

MANUFACTURERS OF  
GASOLINE MOTOR CARS, TRUCKS AND TAXICABS

## B & L CASTER FRONT AXLE MAKES A BIG WINNER

—In Philadelphia—

Our Philadelphia Agent Writes It Is a Great Success

A. S. Burnell, Pres. and Gen. Mgr.,  
1346 Mich. Ave., Chicago, Ill.

Dear Sir—The Axle is a great success, is running fine. Have made several demonstrations and every one says it's the only Front Axle that ought to be allowed to go on the automobile, for safety, easy steering and perfect control. Will sell the majority of those I have demonstrated for. Enclosed you will find order for one Axle to go on a Studebaker car, 1908 model; more orders will follow later. Send us a big cut, for we are going to run a one-half page in our newspaper—we will advertise it right. We will equip at least one thousand cars this year. Our new garage will be at 1907 after March 12th N. 23rd St. Circulars received all O. K. Thanks for same. Rush the order for Axle, as every one on a car will sell several more.

Yours very truly, H. SCHROEDER,  
Pres. and Gen. Mgr. Lake Schroeder Auto Exchange,  
1418 Blavis St., Philadelphia, Pa.

Philadelphia, Pa., Feb. 28th, 1912.

Agents wanted for all cities in the U. S. to put the B & L Caster Front Axle on old cars. Exclusive territory given to good men. Our Axle when on a car proves that it is the only safe Axle made. Write for Agency Proposition. In buying a new car demand that it be equipped with the B & L Caster Axle.

Address A. S. BURNELL, Manager Chicago Branch, 1346 Michigan Avenue

When Writing to Advertisers Please Mention Motor Age.

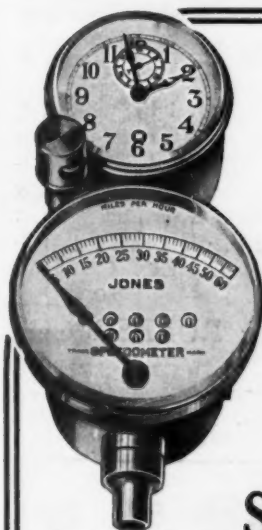


# DON'T WAIT 'TILL YOU'RE STUCK- GET YOUR BASLINE AUTOWLINE TODAY

There's nothing like being ready with this wonderful little steel towline.

It weighs but six pounds, but it can tow a 4,000-pound touring car up a 20% grade with ease. When your wheel is stalled in a rut, "Baseline Autowline" (Patented, Trademark Registered in U. S. Patent Office) can get you out on your own power. You attach one end of the line to your rim. The other end to a tree, 'phone pole or wagon. Use your hub as a capstan. Then start your engine and your wheel has to turn forward. \$3.75 at all good Supply Dealers. Get yours **today**.

**Free** Special bulletin telling the whole story in pictures. Get a free copy. **BRODERICK & BASCOM ROPE CO., St. Louis, Mo.** Used on the last Gildden Tour  
The Little Steel Rope with the Big Pull



Model 520—\$45

## The World's Best Speed Indicator

Get a JONES for your car. Know your speed. When you use a magnetic instrument you've got to guess—because magnetism is liable to fluctuation—according to electrical and atmospheric conditions. JONES is built on CENTRIFUGAL FORCE—the law that is as unalterable as the firmament. It CAN'T go wrong—it MUST be accurate!

Ask your dealer or write for literature

### THE JONES SPEEDOMETER

Factory: New Rochelle, N. Y.

Chicago: 1430 Michigan Ave. Buffalo: 852 Main St.  
Boston: 109 Massachusetts Ave. Los Angeles: 1229 S. Olive St.  
Philadelphia: 416 Vine St. Portland: 329 Ankeny St.  
San Francisco: 544 Van Ness Ave. Seattle: 917 East Pike St.  
Detroit: 41 Washington Blvd.

THE FIRST SPEEDOMETER  
ABSOLUTELY ACCURATE  
WINNER OF THE GOLD MEDAL  
INDORSED BY LEADING UNIVERSITIES

HIGHEST TEST BY BUREAU OF  
STANDARDS

ADOPTED BY POLICE DEPART-  
MENTS

USED BY THE FIRE CHIEFS

ON THE RACING CARS

PREFERRED BY DISCRIMINAT-  
ING OWNERS

## JONES SPEEDOMETER

"KLINE KARS FIRST BECAUSE KLINE KARS LAST"

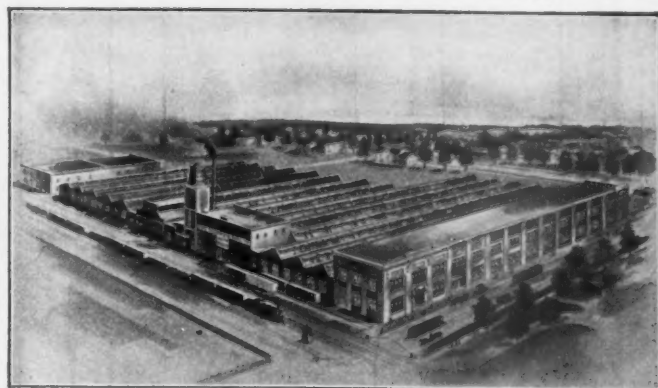
## WANTED

Agents to represent us in the New England States, Southern territory south of North Carolina, and some valuable unoccupied Western territory. Also New York City and Long Island. We manufacture four and six cylinder cars, with **FOUR SPEED FORWARD TRANSMISSIONS** and **SELF-STARTERS**, including complete equipment, at prices from 1700 to 3500 dollars.

Live ones, write for our proposition, outlining territory wanted and facilities for handling our product. Address

**KLINE MOTOR CAR CORPORATION**  
YORK, PA.

FACTORIES—  
YORK, PENNSYLVANIA RICHMOND, VIRGINIA



## QUALITY - QUANTITY

TRANSMISSIONS — STEERING GEARS

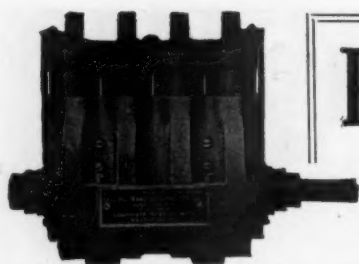
UNIT POWER PLANTS

MOTORS—JACK SHAFTS

CLUTCHES—GEAR SHIFT LEVERS

"TRUCK PARTS"

**The Warner Manufacturing Co.**  
TOLEDO, OHIO



## Four Cylinder KELLOGG Air Pump

Again the  
choice of the  
manufac-  
turers as a  
part of the

regular equipment of all

### Peerless 1913 Cars

Watch for the announcements of the other leading cars for 1913—Kellogg Tire Pumps are best by test. They have made good in every way, and are the choice of the best manufacturers. Before you decide, investigate and you'll choose a Kellogg. The recommendations of the best makers should be strong enough for you.

Send the name of your car  
for complete information

### KELLOGG MFG. COMPANY

43 Circle Street, Rochester, N. Y.

Chicago Office.....1108 Michigan Ave.  
New York Office.....1733 Broadway

## Who Is More Competent

to judge the merits of Brake-Lining than the manufacturer of rear axles?

The Timken-Detroit Axle Co. and other high-grade axle makers have specially designed apparatus to conduct practical and laboratory tests of Brake-Linings, for their engineers must know which is the best lining. They cannot afford to be influenced by outsiders.

As a result of one year's practical experience in the leading cars the Timken-Detroit Axle Co. has renewed its contract for

## AUTOBESTINE

### BRAKE-LINING

A few of the cars  
equipped with  
Autobestine:

THOMAS  
CADILLAC  
COLE  
KELLY TRUCK  
POPE-HARTFORD  
SPEEDWELL  
MERCER  
PULMAN

This stamp of approval by a disinterested authority should convince you that AUTOBESTINE is the Best Brake-Lining. If you realize the necessity for a reliable Brake-Lining on account of the risk, you should demand AUTOBESTINE from your dealer.

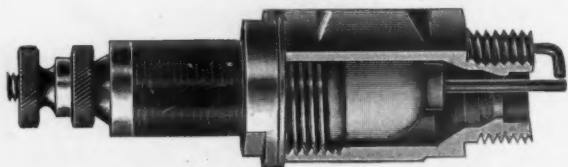
WOVEN STEEL HOSE & RUBBER CO.,  
MANUFACTURER  
TRENTON, N. J.

NATIONAL SALES CORPORATION, Factory Sales Mgr.  
250 W. 54th St., New York—844 Woodward Ave., Detroit.

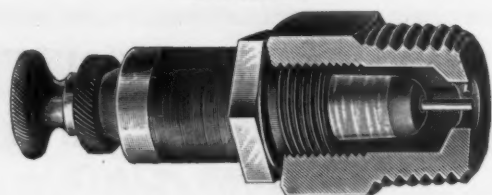
## THE OAKES & DOW CO.

## SPARK PLUGS

SOOTLESS



COMET



### For Highest Compression Engines

In an actual test of 12 best known makes of plugs, our "Sootless" made good—the other eleven could not stand up.

MANUFACTURED AT

15 Chardon Street, BOSTON, MASS.

# AJAX TIRES

(GUARANTEED 5000 MILES)

### Strong Selling Talks for Ajax Dealers

In every Glidden Tour they have entered, Ajax Tires have always made the best showing. In the 1911 Glidden Tour all four of the trophy-winning cars had Ajax equipment, and not one of the sixteen casings had to be replaced during the whole rough trip of 1,454 miles.

Tires that make record trips like this and finish almost as good as new are the kind of tires dealers find profitable to handle. Ajax Dealers report that tire business is always good with them.

Write for Ajax  
Inducements to Dealers

## AJAX-GRIEB RUBBER CO.

General Offices: 1796 Broadway, New York  
Factories: Trenton, N. J.  
Branches in Principal Cities



# BE SAFE and

When a man starts out with HAM'S LAMPS on his auto he knows he's not going home in the dark.

Demand  
America's  
Best



A Postal  
brings  
Auto Lamp  
Booklet



C. T. HAM MFG. CO.  
ROCHESTER, N. Y.

## Use J-M Guaranteed Dry Batteries



J-M Dry Batteries are absolutely guaranteed to give entire satisfaction, and if they don't do it, we will refund purchase price, give you credit, or replace unsatisfactory cells with new ones.

You take no chances at all, because every one of our dealers is authorized to do likewise.

The following test is applied to each lot of these batteries. A cell is selected at random, short circuited through 20 ohms resistance and allowed to run down to the exhaustion point (10 amperes). During a recent test a J-M Dry Battery gave 27 amperes at the start and it took over two weeks of continuous running to exhaust it to 10 amperes.

Shipments can be made same day orders are received.

Your dealer will supply you, or we'll ship direct from our nearest Branch.

Write our nearest Branch for booklet

## H. W. JOHNS-MANVILLE CO.

Manufacturers of Asbestos and Magnesia Products

ASBESTOS

Asbestos Roofings, Packings, Electrical Supplies, etc.

Baltimore Cleveland Kansas City New Orleans Pittsburgh  
Boston Dallas Los Angeles New York San Francisco  
Buffalo Detroit Milwaukee Omaha Seattle  
Chicago Indianapolis Minneapolis Philadelphia St. Louis

For Canada—THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B. C. 1392

## Hotel La Salle

Chicago's Finest Hotel

George H. Gazley, Manager La Salle at Madison Street

The central location, excellent service, elegant equipment and furnishings, and home-like atmosphere make Hotel La Salle the most popular hotel in Chicago.

**Rates:**

**One Person.**

Room with detached bath	-----	\$2 to \$3 per day
Room with private bath	-----	\$3 to \$5 per day

**Two Persons.**

Room with detached bath	-----	\$3 to \$5 per day
Room with private bath	-----	\$5 to \$8 per day

**Two Connecting Rooms with Bath:**

Two Persons -	\$5 to \$8 per day
Four Persons -	\$8 to \$15 per day

**Suites:**

\$10 to \$35 per day

**All rooms at \$5.00 or more are the same price for one or two persons**

## The Hotel The WOODSTOCK

"You can walk from there to anywhere"

Our new addition is ready for occupancy.

We now have 360 rooms with 265 baths.

Write us for descriptive folder with typical floor plan and rate card.

Wire for reservation at our expense.

**RATES**

Court room with bath, for one, per day	.....\$2.50
Court room with bath, for two, per day	..... 3.50
Outside room with bath, for one, per day	..... 3.00
Outside room with bath, for two, per day	..... 4.00
Outside room with twin beds, for two, per day	.....\$4.00

**HOTEL WOODSTOCK**

127 W. 43d St.  
New York

W. H. Vallquette, Manager.

Also  
"THE BERWICK"  
Rutland,  
Vermont

## SAGER EQUALIZERS

The Shock Absorbers which save your car and tires. Nothing to wear, adjust or require attention. They take the "sting" out of rough roads. Try them at our expense for 30 days.

**Seven Years of Success**

ENDORSED BY  
Stoddard-Dayton, Elmore, Olds, Rambler, Saurer, Lippard-Stewart, Franklin, Pope, Autocar, Kissel-Kar, Dorris, Logan, Maxwell, Crawford, Meteor and Jewel.

**Equalizers Succeed Where Others Fail  
THOUSANDS OF DOLLARS**

Saved annually by use of Sager Bumpers. Don't wait for a "smashup" to buy protection.

**DO IT NOW**

**DIAMOND**



Used almost exclusively on high grade cars

**CHANNEL**



Clamped on bumpers of distinction, attached in 10 minutes.

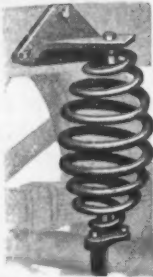


**ROCHESTER**

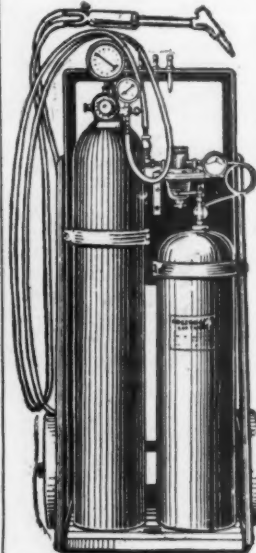


Prices \$6.00 to \$27.50  
Liberal Discounts  
**PROTECTION**

J. H. Sager Co., 275 S. Ave., Rochester, N. Y.



## You Need a Prest-O-Welder



This welding outfit will pay for itself in a short time. It is the simplest, most efficient welder you can buy. Turns on and off like a gas jet. Can be wheeled anywhere.

\$2,528.50 worth of parts were saved and made good as new in one shop, in one month, at a cost for material and labor of \$249.81.

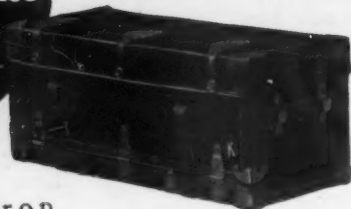
Any Garage Man or Manufacturer will find it a paying piece of equipment. Thousands of live men are going to start businesses with big profits through this simple equipment.

Our literature shows how welding jobs formerly called "impossible" are easily done. Learn the particulars now. You lose by waiting. Write today.

**The Prest-O-Lite Co.**  
233 W. South Street  
Indianapolis Indiana  
Exchange Agencies Everywhere

## THE NEW KAMLEE AUTO TRUNK IS ABSOLUTELY DUST-PROOF

See the  
new Interlock  
Edge—It makes  
the Kamlee  
air tight



The edges of drop front and top lock together as shown in sectional view at left. A rubber tubing at bottom of groove conforms to any irregularity or give in top and front.

Every Kamlee is fitted with two or more standard sized removable suit-cases, which can be removed without taking trunk from rack. Kamlees are made to fit any car.

A water-proof covering is fastened over the top with patent spring-swivel nuts. No straps to bother with in opening.

See the new Kamlee at your dealer's. If he doesn't have it, write for prices and booklet.

**THE KAMLEE COMPANY**  
234 Broadway  
Milwaukee, Wisconsin

Regular Kamlee

Look for  
This  
Trade  
Mark  
on Lower  
Right  
Corner  
of Trunk



Open—Showing  
suit cases

When Writing to Advertisers, Please Mention Motor Age.

## THE BECKLEY RALSTON CO.

### Automobile Supplies

NEW LOCATION  
INCREASED SPACE  
LARGER STOCK  
IMPROVED FACILITIES  
Meaning—

QUICK AND COMPLETE  
SHIPMENTS

If Not on Our List  
Write for Catalog

### Wholesale Only

ESTABLISHED 1896

## THE BECKLEY RALSTON CO.

Michigan Avenue and Randolph Street  
CHICAGO



When YOU Buy a Burner

Say, **"RONI"**

The Air  
Goes In  
HERE



The RONI



The Imitation



Patented

## THE BRAY "RONI"

IS THE ONLY

ONE - HOLE ATMOSPHERIC BURNER

Look out for other burners that are made to look like the "Roni"—made so to fool you.

**ASK FOR THE "RONI"**

The one best burner for your acetylene lamp. Use it and be protected against broken lens or reflector.

**THE BRAY "RONI"**

**WILL OUTLAST OTHER BURNERS**

because it mixes air with the gas, and it's this air that keeps the burner from clogging up with carbon.

**ASK YOUR DEALER—BUT ASK FOR THE "RONI"**

**W. M. CRANE COMPANY**

*Sole Importers*

16-18-20 W. 32d St.

NEW YORK

## LAUTH-JUERGENS



**QUALITY DURABILITY**

**ONE, TWO AND THREE TON CAPACITY**

LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation, and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one ton, four cylinder, one, two and three ton. Four speeds forward. Hees-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

*Reliable Agents, Secure Your Territory for 1912 at Once*

**Lauth-Juergens Trucks are Delivery Insurance**

**Lauth-Juergens Motor Car Co., Fremont, O.**

**BRANCHES AND AGENCIES:**

Boston—Lauth-Juergens Motor Co. of New England, 9-11 Harcourt St.  
New York—West Side Garage & Motor Co., 160-162 W. 101st St.  
Chicago—The Lauth-Juergens Motor Car Co., 2680-32 Wabash Ave.  
Newark, N. J.—Merchants Motor Car Co., Essex Building.  
Duluth, Minn.—Mutual Auto Co.  
Toledo, Ohio—Grasser Motor Co.  
District of Columbia and Vicinity—Bowles Motor Sales Co., Inc., 1608 14th St., N. W., Washington, D. C.

Agents for Southeastern Michigan—Bleil Auto Truck Sales Agency, 453 Dix Ave., Detroit, Mich.

## "BARRETT"

AUTOMOBILE JACKS



STANDARD EQUIPMENT  
FOR THE BETTER CARS

**The DUFF MAN'FG. CO.**

ESTABLISHED 1883

50 Church St. N.Y.

Pittsburgh, Pa.

## A NECESSITY IN EVERY UP-TO-DATE GARAGE

Isn't it rather poor business policy to stick to the old, wasteful, uncleanly and dangerous methods of handling oil and gasoline when economy, safety and convenience can be gained by the installation of a

### Bowser Storage System

You are always sure that gasoline will be kept clean in a BOWSER tank. No foreign substance can gain admittance to contaminate it. Clean gasoline means clean cylinders, clean pistons, clean valves—a long-lived motor always at its highest efficiency, utilizing every drop of fuel to your own best advantage. Clean fuel will save the cost of a BOWSER in the increased life and service it gives to your car.

Your gasoline will be kept safely in a BOWSER UNDERGROUND TANK, free from all danger of fire and an insurance against damage to your property.

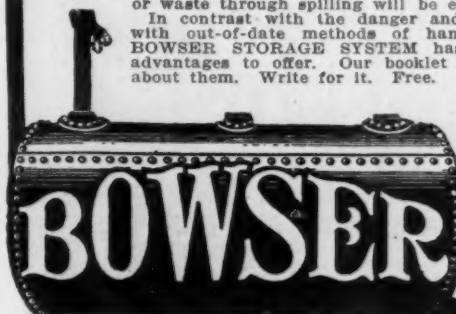
Your gasoline will be kept economically in a BOWSER EVAPORATION PROOF TANK. Loss through deterioration or waste through spilling will be entirely eliminated.

In contrast with the danger and waste connected with out-of-date methods of handling gasoline, a BOWSER STORAGE SYSTEM has numerous other advantages to offer. Our booklet 4-B will tell you about them. Write for it. Free.

**S.F. BOWSER  
& CO., Inc.**

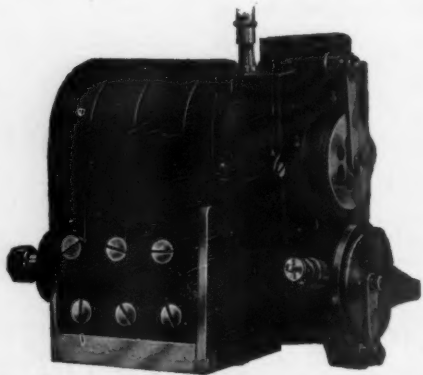
**Ft. Wayne, Ind.**

New York, Boston, Chicago, St. Louis, Minneapolis, Philadelphia, Dallas, Atlanta, Toronto, San Francisco.



*When Writing to Advertisers, Please Mention Motor Age.*

**\$30.00** For this \$105.00 6-Cyl-  
inder U. & H. Magneto



### Third Annual Magneto Bargain Sale

Imported High Tension Magnetos at Less  
than Cost of Importation

Our third annual genuine inventory sale of U. & H. Master Magnetos, made in Germany, is now in progress. All H. P. sizes and types for 1, 2, 4 and 6 cylinder motors, suitable for motor cars, motor wagons, motor boats, motorcycles, stationary engines, etc. Write now, before they are all gone, for circular and price list. The sale is a real Magneto money saver.

**J. S. BRETZ COMPANY, Sole Importers**  
250 W. Fifty-fourth Street, New York

## Golden Star Auto Body Polish Keeps Your Car Well Groomed

It cleans, polishes, preserves and protects the finish as nothing else can do.

Easy and convenient to use.

A few drops of Golden Star Polish used on the dust cloth and your car looks bright, clean and new.



### Free Sample

Let us prove (without cost to you) the merits of Golden Star, "The World's Best Cleaner and Polisher." Ask your dealer for a free sample or write us and it will be sent you at once.

**DEALERS**—Your customers will appreciate good service. Sell them Golden Star Polish. Ask your jobber—he can supply you.

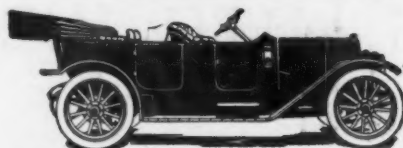
**R. W. MORRIS MFG. CO.**  
Incorporated  
Kansas City, Missouri

# Long Radiators

THE LATEST DEVELOPMENT  
IN  
**High Grade Radiators**

THE LONG MANUFACTURING CO.  
Detroit, Michigan

**Halladay 30**  
**\$1100**



Examine our line for 1912  
Best agency proposition  
Three Chasses—Nine Models

WRITE US TODAY

**STREATOR MOTOR CAR COMPANY**  
STREATOR, ILLINOIS

30 H.P. Model L \$1250  
**Colby CARS**  
40 H.P. Model H \$1750  
**SELF STARTING!**  
EXTRA MODEL L 1912 STANDARD MODEL H  
**COLBY MOTOR CO.**  
MASON CITY, IOWA.

The Easiest Riding  
Car in the  
World

# MARMON

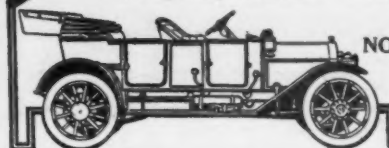
INTERNATIONAL  
CHAMPION

A rational, logical car for city use  
or touring. One chassis—a body type for  
every requirement. Touring Car, \$2750.

Ask for Catalog

**NORDYKE & MARMON CO.**  
(Established 1851.)

Indianapolis, Indiana  
Sixty years of successful  
manufacturing.





ACCURACY — RELIABILITY — DURABILITY — ECONOMY

are assured to the greatest extent in charging stations and other electric plants, by the use of the

**WESTON** SWITCHBOARD  
and PORTABLE

**INSTRUMENTS FOR ELECTRICAL MEASUREMENT**

These instruments represent the greatest advance thus far in the art of electrical measurement

Full information is contained in catalogs, which will be sent upon request

New York  
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**WESTON ELECTRICAL INSTRUMENT CO.**  
NEWARK, N. J.



**Keep It Handy**

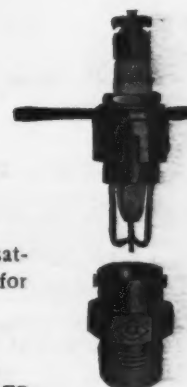
You will find uses for it every day in the week. Has no equal in cleaning the hands of dirt and grime. Cuts grease from floors quickly and easily. Absolutely harmless to the skin or articles cleaned.

Many Uses on  
Large Sifter-Can 10c

**Old Dutch Cleanser**



The Sign of a Good Spark Plug and a "Live" Dealer



Adjusted in 4 Seconds  
Without a Wrench

THE "E. Z." is altogether the most satisfactory spark-plug manufactured for

**AUTOMOBILES  
MOTOR TRUCKS**

**MOTOR-BOATS MOTOR-CYCLES**

PRICE

Positively holds full compression; can be locked to 2000 pounds pressure by a mere twist of the hand. There is only one "E. Z." spark-plug. Insist upon your dealer selling it to you, or write

Complete Plug..... \$1.25  
Interchangeable Core... 75c  
Core Socket..... 50c

**THE AUTOPARTS MFG. COMPANY**  
F-810 Westside Ave., JERSEY CITY, N. J.



**DISCO SIMPLE AND SURE**

SELF STARTER

The extreme simplicity and absolute reliability of the

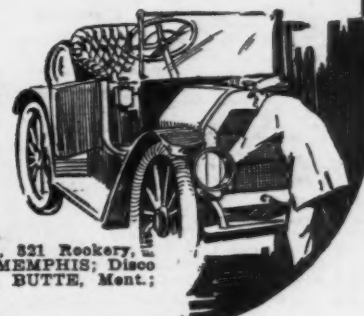
**Disco Starter**

explains its adoption by the experts of the motor car world.

**THE IGNITION STARTER CO., 710 Ford Bldg., Detroit, Mich.**

*Largest Manufacturers of Self-Starters in the World*

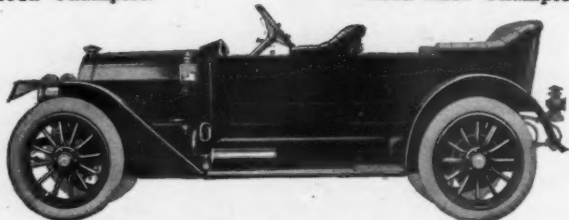
THE ARISTON CO. EASTERN DISTRIBUTORS: 250 West 54th St., New York; 1002 Boylston St.; BOSTON; 649 N. Broad St., PHILADELPHIA; PITTSBURG; J. H. Palmer & Co., 321 Reekery, CHICAGO; John R. Ball, 41 Patton Bldg., MILWAUKEE; J. T. Fisher, Memphis Motor Co., MEMPHIS; Disco Auto Starter Co., Toledo; McCrae-Whirl Co., 2045 Euclid Ave., CLEVELAND; J. B. Freund, BUTTE, Mont.; F. S. Wismeyer, 3184 Park Ave., ST. LOUIS.



## National 40

Stock Champion

Road Race Champion



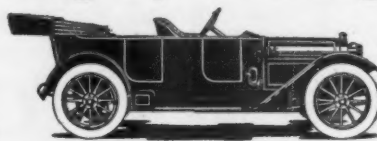
Five Passenger Touring Car, Series V., \$2,900.

National Motor Vehicle Company

1006 East Twenty-second Street

Indianapolis, Ind.

## Mighty Michigan Forty



40 - Horsepower  
Touring Car or  
Roadster, absolute-  
ly silent in opera-  
tion. Cylinders  
4 1/4 x 5 1/4-in.—116-  
in. wheel base—  
34x4-in. tires—de-

mountable rims—nickel mountings—massive, straight line  
body—big, roomy seats—proved self-starter—everything.  
Price \$1500. Guaranteed for life by the Michigan Buggy  
Company. 40-horsepower Roadster on the same chassis.  
Two smaller models. Catalog on request.

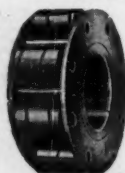
MICHIGAN BUGGY COMPANY

(53)

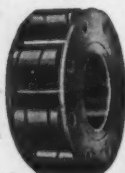
187 LAY BOULEVARD,

KALAMAZOO, MICHIGAN

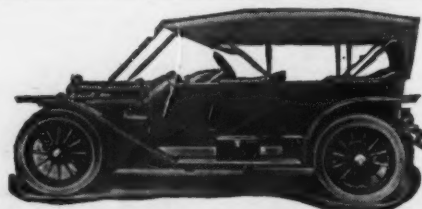
Eliminate  
Noise in  
Your Car



Use Hyatt  
Roller  
Bearings



Hyatt Roller Bearing Co.  
Detroit, Michigan



Type 35—Series A and B—\$2750. Fully Equipped.

## MERCER CARS

are built for years of service—not for one  
year only. That is why they "make good" under  
all conditions.

Send for Catalogue

MERCER AUTOMOBILE CO., 800 Whitehead Road, Trenton, N.J.



# AC



This name stands for efficiency in  
**SPARK PLUGS**

Used as standard equipment by  
seventy-four prominent manufacturers

CHAMPION IGNITION COMPANY, Flint, Mich.

Do you know there's money  
in a  
**VULCANIZING PLANT?**

There is if your equipment comprises an econom-  
ical, reliable and efficient

**ATTACHED SLIDING HINGE CLAMP Steam Vulcanizer**

The outcome of years of experience, it stands  
forth today as the only satisfactory steam vulcan-  
izer on the market. Designed and constructed by  
one of the oldest vulcanizers in the country. Be  
independent. Start a vulcanizing plant of your own.  
Hundreds of vulcanizers all over the country are  
conducting a profitable business with our outfit.  
20% to 60% profit per day. Made in all sizes, at all  
prices, for all requirements. Write for booklet.

MEILI-BLUMBERG COMPANY, New Holstein, Wis.

**TROJAN**  
SAVES YOUR TIRES  
"TROJAN"  
Portable  
Electric Tire Pump

Increase the serviceability of  
your tires with a



Improper inflation throws all the wear and  
tear on your softest tire. Economize by  
equally distributing your tire wear. The  
TROJAN automatically keeps all four tires  
at the same pressure all the time. It pays  
for itself out of the added service it gives  
your tires. Attached in one minute to any  
electric light socket. Adjustmentless—  
tankless—pipeless—noiseless.

Single Cylinder prices  
Direct current.....\$75  
Alternating current, \$85

Double Cylinder  
Direct current.....\$140  
Alternating current, \$150

DAL MFG. CO.  
57 E. 24th St., Chicago

## INVINCIBLE

Price \$2.00

TIRE  
PRESSURE

## TESTER



Simply press on tire stem—  
and the indicating hand will  
record the pressure in tire.  
The indication is held so  
that tester may be removed  
from tire and read. To re-  
turn pointer to zero, push  
pin "A."

UNITED STATES GAUGE COMPANY, 67 Wall St., New York  
CHICAGO OFFICE: 321 N. CLARK STREET

When Writing to Advertisers Please Mention Motor Age.



## WINTON SIX

### CONVERTED THE INDUSTRY

Be not misled—it was the Winton Six, single-handed and alone, that converted the automobile industry from four to six cylinders. It took us four years to convert some makers. But we could only supply the proof of Six superiority; some men are slower than others to see the light.

*Shall we send our Catalog?*

**THE WINTON MOTOR CAR CO.**  
424 Berea Road, Cleveland, O.

## GRAND RAPIDS MOTOR TRUCK CO.

MANUFACTURERS OF THE

## HOOSIER LIMITED

1½ TON TRUCK

Formerly made by the Decatur Motor Car Company  
Decatur, Indiana

SOME CHOICE TERRITORY STILL OPEN

ADDRESS

**GRAND RAPIDS MOTOR TRUCK CO.**  
NORTH ST., GRAND RAPIDS, MICHIGAN

## Weed Chains

Absolutely Prevent Skidding

Necessary on Rear Wheels  
Advisable on Front Wheels

For your own safety—for the safety of the public, fully equip your car with Weed Chains

AT ALL DEALERS

**Weed Chain Tire Grip Co.**  
28 Moore St. New York

## The Kinsey Manufacturing Company, Toledo, Ohio

MANUFACTURERS OF AUTO PARTS

KINWOOD RADIATORS, FENDERS,

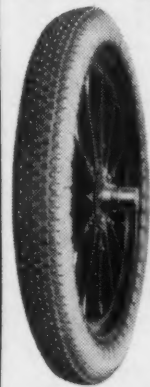
KINWOOD OILERS, GASKETS,

KINWOOD STEEL FRAMES,

ETC., ETC.

SPECIAL METAL STAMPINGS

## DURABLE TREADS



are sold under a **Written Guarantee** to wear 5000 miles without puncture.  
Cost Delivered to you by prepaid express for about one-half the price of new tires. Your inspection before paying a cent if you to \$150 in tire bills this season by equipping now.

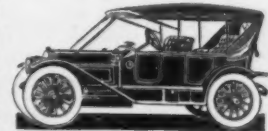
Write for catalog and copy of guarantee.

**COLORADO TIRE & LEATHER CO.**  
1023 Broadway, Denver, Colo.

## EVERY DEALER—EVERY AGENT

Engaged in selling motor cars will find it to his interest to take advantage of this opportunity to get in touch with the "Enger" factory immediately. You and your prospective customers ought to know all about the New "Enger." We want you to have the full details that you may find by actual comparisons the "Enger" will show more real practical value than any other car selling under \$1,850.

Just now we want some real, live, hustling dealers and agents, who know a good car when they see it and, having seen it, know how to sell it. We have the car. It's built right and honestly; it has everything necessary for comfort and convenience and at a price that will defy competition. Are you going to be with us? Just take a peep at our commercial rating, then write for the "Enger" proposition.



**\$1475.00 fully equipped**  
**THE ENGER MOTOR CAR COMPANY**  
2101 Gest Street Cincinnati, Ohio

**Wisconsin**

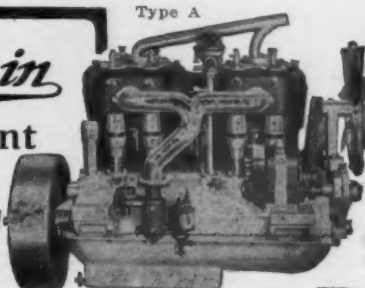
The Consistent  
Motors

Real masterpieces of engineering skill. Note their special features—examine their perfect construction.

Large Bearings Large Valves  
Perfect Lubrication Ample Water Jacket  
Double Ignition Perfect Workmanship  
Heavy Crank Shaft Long Stroke

Write us and we will tell you where a Wisconsin Motor may be seen.

**WISCONSIN MOTOR MFG. CO.,**



ALL 4 CYCLE—IN 5 TYPES

3½ inch bore, 5 inch stroke, 4 cylinder  
4½ inch bore, 5 inch stroke, 4 cylinder  
4½ inch bore, 5 inch stroke, 6 cylinder  
4½ inch bore, 5½ inch stroke, 4 cylinder  
5½ inch bore, 7 inch stroke, 4 cylinder

Dept. 25, Milwaukee, Wis.

## AUBURN 1912

"Rides like a Pullman; and pulls like a locomotive"

Gives the satisfaction that only a good article can

Model 30 L—Roadster, Two Passenger Car, 30 H.P., \$1100.

Model 30 L—Five Passenger Touring Car, 30 H.P., \$1100.

Model 35 L—Five Passenger Touring Car, 35 H.P., \$1400.

Model 40 H—Five Passenger Touring Car, 40 H.P., \$1650.

Model 40 M—Two Passenger Roadster, 40 H.P., \$1750.

Model 40 N—Five Passenger Touring Car, 35-40 H.P., \$1750.

Model 6-50—Six-cylinder Touring Car, 50 H.P., \$3,000

Send for 1912 Catalog

**AUBURN AUTOMOBILE COMPANY, Auburn, Indiana**

# SPLITDORF

## MAGNETO

*"Always There"*

**C. F. SPLITDORF**

Walton Ave. and 138th St.,	NEW YORK
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DETROIT	KANSAS CITY
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	SAN FRANCISCO

# Self HANNA Starter

The only 100% efficient self-starter that will not foul or soot your plugs.

## J. H. Valentine Company

SYRACUSE, N. Y.

The equal of any manifold starter on the market **\$10**

# The Valentine MANIFOLD STARTER and Gas Lighter

## W. H. McINTYRE CO.

Vehicle Builders Since 1869

AUBURN, INDIANA

### Pleasure Cars

4 Cyl., 35 H. P., 3 passenger, Self Starter.....	\$1350.00
4 Cyl., 35 H. P., 5 passenger, Self Starter.....	1350.00
4 Cyl., 45 H. P., 4 passenger, Self Starter.....	1850.00
4 Cyl., 45 H. P., 5 passenger, Self Starter.....	1850.00

### Commercial Cars

Capacity, 600 to 6000 Lbs.

VEHICLE BUILDERS FOR NEARLY FIFTY YEARS

Write for Agency Today

1301 W. 7th St.  
AUBURN, INDIANA



## INTERLOCK INNER TIRES

PREVENTS  
PUNCTURES  
AND  
BLOW-OUTS

Write  
for  
Booklet

"For every tire—new or old." Prevent blow-outs—save you tire money—rid you of the nagging bother and fear of these troubles.

They reinforce the sides of the tires, as well as the tread. Completely surround the inner tube and have no open edges or joints to chafe or pinch the tube. Easy to put in and remove. Use them over and over again.

DOUBLE FABRIC TIRE CO., 128 W. 9th St., Auburn, Ind.

## No Cranking! No Pumping!

Guaranteed to start your car from the seat. Always ready and positive.

The "American Starter" is the ONLY starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the "AMERICAN STARTER."

### American Starter & Carburetor Mfg. Co.

2022 So. 40th Avenue, Chicago.

## "42"

# Ames

## "42"

### POWER SILENCE REFINEMENT

36x4 wheels  
116-in. wheelbase

Write for dealers' proposition

## \$1485

AMES MOTOR CAR CO.  
Owensboro, Kentucky

## Motoring Expense Cut

Tires are the biggest item of motoring expense.

### The Gibney Eleck-Trick Vulcanizer

cuts down this expense one-third to one-half. Why? Because, applied to cuts and bruises before they become large and serious, this little economy device greatly lengthens the life of tubes and cases. It's easy to operate because it operates itself. Simply clamp it to the injured part, turn on the current and in a short time you have a tire or shoe that's as good as new.

A booklet telling how you can greatly cut down your tire bills is awaiting your postal. Send for it now.

### JAMES L. GIBNEY & BRO.

222 NORTH BROAD STREET,  
248-52 WEST 54th STREET

PHILADELPHIA, PA.  
NEW YORK CITY



## SHINE UP!

Keep your automobile like new *always*. Every part of your car—windshield, lamps, fenders and body—can be brightened up with

# LUSTRE

HIGH GRADE

### Automobile and Furniture Polish

(NOT STICKY—CAN'T INJURE)

You can tell LUSTRE from other polishes by looking for the creamy emulsion at the TOP of the bottle—no sediment—no solid substances at the bottom to scratch or mar.

**TRIAL OFFER** Your dealer will sell you a regular 10c size bottle of LUSTRE (a generous trial) for 5c. 6-oz. bottles 25c, pints 50c, quarts 80c, and gallon jugs 2.00. If not at your dealer's, send up his name and 4c in stamps to cover cost of mailing and we'll send you a regular 10c size bottle.

**Lustre Manufacturing Co.** 5574 Woman's Temple, Chicago



# "Invincible"

TRADE MARK  
**STARTER**

Price  
**\$25**



**THE VALUE OF SIMPLICITY**  
Simplicity of construction accounts for the low cost and high efficiency of the INVINCIBLE STARTER. Because it can be made for less than other high-class starters, it can be sold for less. Because it is not complicated, it is as safe as it is trouble-proof. Its parts are so few, its operation so direct, that it can't get out of order. Anyone can understand an INVINCIBLE, anyone can operate it.

It operates on a properly proportioned mixture of acetylene gas and air. Press the button, turn on the switch—the motor starts. Costs less than 1-25 of a cent per start. Used as standard equipment by the U. S. Motor Co. The best starter for the motorist—the best for the dealer.

Write for our generous agency proposition.

THE INVINCIBLE STARTER CO., 700 Penobscot Bldg., Detroit, Mich.



Climbs a 50% grade—any number of speeds—friction transmission.  
Five models. Write

**CARTER CAR COMPANY, PONTIAC, MICHIGAN**



**EAGLE**  
WINDSHIELD  
OF  
QUALITY

Made Right  
Sold Right

WRITE FOR  
CATALOGUE TODAY

**EAGLE CO., 98 Warren St., Newark, N. J.**

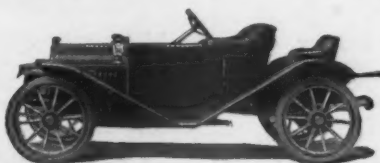


"THE THOROUGHbred"

and price can you receive greater value than that offered in the 1912 Herreshoff models.

The luxurious upholstery, the riding qualities, the economy in the use of gasoline and oil, place the Herreshoff in line with cars selling at double the price.

**THE HERRESHOFF MOTOR COMPANY, Detroit, Mich.**



Roadster ..... \$ 950  
Touring Car ..... \$1150  
Coupe ..... \$1400

In no other car of its size, power, equipment

## MOST WIDELY IMITATED OF ALL

### REPUBLIC STAGGARD TREAD TIRES

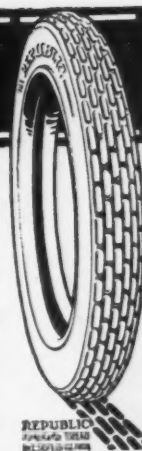
WHERE safety, durability, tire economy, ease of attachment, absolute freedom from skidding and all 'round efficiency are desired—there is but one tire to choose. No other tire will stand the test in competition with the Republic "Staggard Tread."

### THE ORIGINAL EFFECTIVE NON-SKID TIRE

Six rows of heavy rubber studs are arranged so that they exert a positive resistance to side pressure from any direction at angles with the straight course and make skidding or slipping practically impossible.

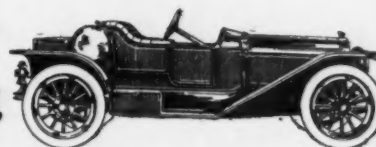
**THE REPUBLIC RUBBER CO., Youngstown, O.**

Branches and Agencies in the Principal Cities.



### The Pioneer Moderate Priced Six-Cylinder Car

Havers  
Self-  
Starting  
"Six-44"



Price  
**\$1850**

Specifications Talk — Six-cylinder motor, 4-cycle, long-stroke type; 44 H. P. Bosch Magneto; dual system; Model "C" Stromberg Carburetor; 36x4-inch wheels; Self Starter. Wheelbase, 122 inches; springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type. Full specifications sent on request.

**Havers Motor Car Co., 2755 26th St., Port Huron, Mich.**



Ward Leonard Dynamo Electric Lighting System, Self Starter, Unit power plant; 4 1/2 in. x 5 1/4-in. motor, enclosed valve, Bosch ignition, Timken axle equipment; 36 x 4-in. wheels; demountable rims; 122-in. wheel base; nickel trimmings; seven bodies; \$1885. Henderson Motor Sales Co., General Sales Indianapolis, Ind.

## BUDA MOTORS & TRANSMISSIONS

"The Peer of the Motor World"

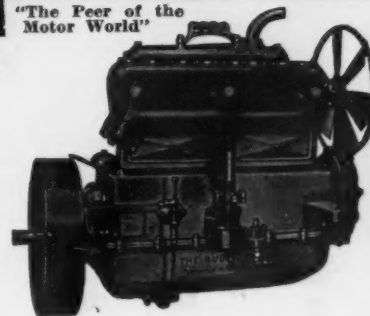
### MOTOR MODELS

"M" 3 3/4 x 4 1/2  
"O" 4 1/8 x 5 1/2

Write for Catalogue 161

**BRANDENBURG & CO.**  
1108 So. Michigan Ave.,  
Chicago.

Broadway and 57th St.,  
New York.  
708 Ford Building, Detroit.



When Writing to Advertisers, Please Mention Motor Age.

## TIRE TROUBLES

HAVE NO TERRORS FOR USERS OF  
AUTO INNER CASINGS

REDUCE MILEAGE COST 50%

We publish a valuable little booklet, "THE CARE AND WEAR OF TIRES," which we will send FREE on request. Write today and learn something about tires.

**Western Automobile Supply Co.**  
3900 Sheridan Road Chicago, Illinois

## Diamond Tires

We could build them cheaper  
*But We Won't.*

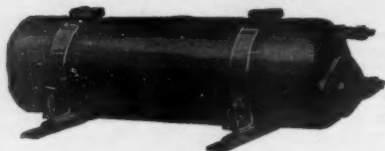
We would build them better  
*But We Can't.*

**THE DIAMOND RUBBER CO.**  
AKRON, OHIO

## CARBO-LIGHT

### TANK GENERATORS

Give a steady white Flame because they supply a steady flow of Clean Dry Gas. Anyone, anywhere, can recharge one in a few minutes. Old-fashioned generators, with dirty yellow lights, forgotten. Cost, one-fifth of storage gas.



Proposition for  
Dealers. Literature  
on request.

**CARBO-LIGHT CO.**  
Anderson, Indiana

## HEINZE IGNITION

Typifies Excellence of Construction and Materials Used

**Coils, Magnetos, Timers, Spark Plugs**

Catalogue B sent to any address

**HEINZE ELECTRIC COMPANY**  
Lowell, Mass.

**WATERHOUSE & LESTER CO., CALIFORNIA**

San Francisco Sacramento Oakland San Jose Los Angeles  
PACIFIC COAST DISTRIBUTORS

## ZENITH Carburetor

Now made in America by

**ZENITH CARBURETOR COMPANY**  
268 Jefferson Avenue, Detroit, Mich.

## AIR COMPRESSORS

For  
Private and Public

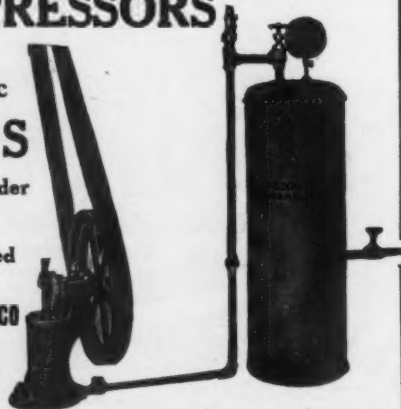
### GARAGES

Single and Double Cylinder

Air and Water Cooled  
Types

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Western Representatives.



Two  
Turns

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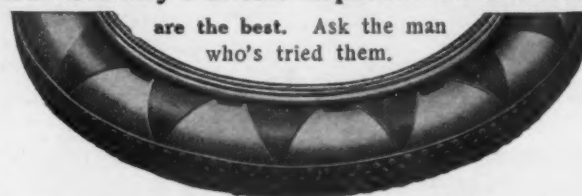
The Rim  
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The  
Rim for  
Demounting



**THE UNITED RIM CO., AKRON, OHIO**

## 20th Century's Latest Improved 1912 Models



are the best. Ask the man  
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They will save your TIME, your MONEY and your TIRES. See our Catalog and low prices before spending more money on your Tires.

Write today for Booklet "TIRE SENSE."

**TWENTIETH CENTURY TIRE PROTECTOR COMPANY**  
Main Office and Factory, Midlothian, Texas.

Dallas Office, Pacific and Olive Sts., Dallas, Texas.



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### Long-Stroke "32" Touring Car, \$900 F.O.B. Detroit

Motor  $3\frac{1}{4} \times 5\frac{1}{2}$  inches; four cylinders; Bosch magneto; three speed sliding gears; tires  $32 \times 3\frac{1}{2}$  inches; 106-inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Runabout body on same chassis and with same equipment, \$900 F. O. B. Detroit.

#### 20 H. P. MODELS

**Runabout—\$750**  
F. O. B. Detroit. Same power plant as World-Touring Car.

Wheelbase 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

**HUPP MOTOR CAR**

**Roadster—\$850**

F.O.B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 in.

Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

**CO., 1228 Jefferson Ave., Detroit, Mich.**

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## The Panwood Self-Starter

### AN INTERESTING PROPOSITION TO DEALERS

This is a self-starter year. Every up-to-date motorist is demanding a good starter as part of his car equipment. Every up-to-the-minute dealer is supplying that demand with the PANWOOD—the surest, most efficient and economical ignition starter on the market. It is self-selling—it stays sold. PANWOOD sales are trebling every month. Get your share of the generous profit which goes with big sales by becoming the PANWOOD dealer in your vicinity now. Get in touch with us.

### Start Right with a Panwood Starter

Panwood Mfg. Co., 600 Mich. Trust Bldg., Grand Rapids, Mich.



### Evidence Proves This Case

All blowouts and 90% of punctures in automobile tires can be prevented with

### Auto Puncture-Proof Casings

We have facts to prove this.

Try a set of these casings. If they do not eliminate all blowouts and 90% of punctures, you can have your money back.

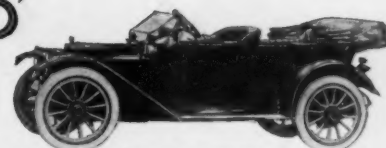
Write for booklet, "How to Reduce Your Tire Expense."

**STATES MANUFACTURING COMPANY**

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TOURING  
CARS  
TOY  
TONNEAU  
ROADSTERS



PRICE  
\$2,250

DOUBLE IGNITION

35 H. P. "T-Head" Motor, 120" Wheel Base, 36" Wheels, Roomy, Graceful, Fore-Door Bodies

**REPUBLIC MOTOR CAR CO., Hamilton, O.**

ASK YOUR DEALER  
and if he does not handle the

## Hays Special Gas Analysis Instrument

write us for particulars and be sure to mention the dealer's name.

The Exhaust tells the whole story of Carburetion, Combustion, Efficiency and Power.

The Hays Instrument tells the whole story of the Exhaust.

Do you want all of the power and efficiency coming to you from your automobile?

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Rogers Park

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## REDUCE YOUR TIRE BILLS

Equip your car with "UNIVERSAL" tire protectors. Cost less than casings; wear longer. Puncture proof, non-skid; their use means freedom from all annoyance, delay, danger and expense due to tire injury. Adjustable and detachable. Fit any and all makes of tires. Anyone can put them on. Special price to users in unoccupied territory.

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## Build a "Six" for 1912

Nothing is more certain now than the supremacy of the six cylinder car. Every year there are more "sixes," and "sixes" at lower prices. Your line will be stronger if you add a "six" at from \$1600 to \$2000 equipped with the

### Beaver "Six" Unit Power Plant

With cylinders  $3\frac{3}{4} \times 5$  inches this motor has the much desired long stroke and just the right power—40-45 H. P. Valves are extra large, and the enclosed valve action is noiseless. Transmission unit enclosed with motor has plate clutch and 3 speed forward selective sliding gear-set. Write for catalog of other motors and prices.

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5-Passenger Touring Car

Model SS \$950 Self-starter and other special equipment.

Standard Model \$850 Fully equipped, but without self-starter and other special equipment.

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"The first advance in coach-making in over a century."

Six models — \$1750 to \$5000

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Lets the Motor fill the Tires



Adaptable to All Makes of Cars

Simply substitute the pump for any spark plug, let your motor run, and without a bit of exertion on your part it will fill your tires with cool, pure air. It weighs but 2½ pounds and can be conveniently carried under the seat. So simply constructed it cannot get out of order. It will last as long as your motor. Adapted to any car. To be had at one-half the cost of high priced complicated pumps.

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REG. U.S. PAT. OFFICE

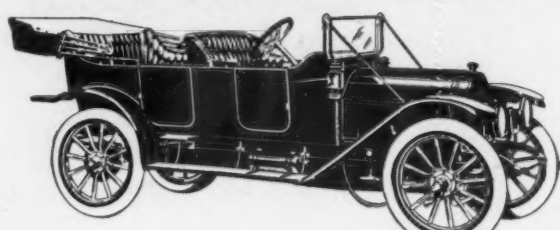
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All Sizes All Styles Porcelain or Mica **\$1.00**

EMIL GROSSMAN CO.  
Manufacturers  
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T-head block motor, 4½x5, very large 3-bearing crank shaft, 2¼" valves, all working parts enclosed, wheel base 120", 36x4 tires, Q D rims, fully equipped with self-starter, \$1800. Write for catalog.

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Write today for our booklet.

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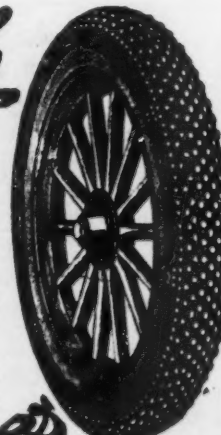
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WOODWORTH TREADS are the only true tire protectors. They never chafe or heat the tires. They are held in place by coil springs along the sides, which automatically take up all slack and prevent any looseness. The protector is always tight and smooth.

No other protector can be fitted in the way that these automatically fit themselves.

They fit all makes of tires—anyone can easily put them on. Send for Catalogue. Leather Tire Goods Co., Niagara Falls, N. Y.

Canadian trade supplied from Niagara Falls, Ont.



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SHAFT DRIVEN

The highest priced electric made in this country, with the lowest cost of upkeep.

*A decided economy in the long run*

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FOR LONG RANGE - FOR SHORT RANGE

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## ELECTRIC HORN

The choice of motorists who realize the need of a long range warning and the value of press-the-button operation, yet who desire not to startle or offend those whom they warn. It is the signal of a gentleman and a careful driver.



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Still in business and growing every day.  
More and more an inspiration. Watch us grow.

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## Cutting CARS

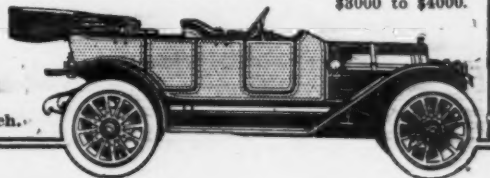
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will make you a posted purchaser and enable you to form an estimate in your selection of a car that is conservatively the most for the money. Cutting cars cost less per Horsepower and per Wheel Base inch than any other automobile selling for \$1200 or more. In point of design, workmanship and finish they are the equal, and in some instances superior to cars selling for from \$3000 to \$4000.

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Lights your lamps (without battery connection), charges your batteries, operates power-horn, inspection lamp, etc. A complete system—not a makeshift.

## GRAY & DAVIS ELECTRIC LAMPS

Are supplanting oil and gas lamps wherever automobiles are used. Send for catalogue describing lamps and Dynamo.

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For 1912

### NORWALK SIX UNDERSLUNG

FOUR, SIX OR TWO PASSENGER.....\$2950.00  
COMPLETE EQUIPMENT

### NORWALK "45" FOUR CYLINDER

FOUR, SIX OR TWO PASSENGER.....\$2150.00  
COMPLETE EQUIPMENT

THE NORWALK MOTOR CAR CO., Martinsburg, W. Va.

*Speedwell*  
A Car with those  
Qualities that really count  
THE SPEEDWELL MOTOR CAR CO.  
DAYTON, OHIO.

Speed Car  
2-Passenger  
Equipped  
with  
Self-Starter

## FINISHED CRANK SHAFTS COMPLETE CONNECTING RODS COLD DRAWN STEEL SHAFTING

Screw Stock, Flats, Squares, Hexagons and Special Shapes

FINISHED MACHINE KEYS - MACHINE RACK

All material finished to a superior degree of accuracy.

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The Warren not only sets the pace for quality but for service.

"Deeds, Not Words," is the Warren motto.

Write for details of these models:

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Including Top and Automatic Windshield. Self Starter, \$50 extra.

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Including Self Starter, Automatic Windshield, Silk Mohair Top, etc.

WARREN MOTOR CAR CO., Holden Ave., DETROIT, MICH.

## MICHENER'S CHAIN CARBON REMOVER

Has had the most phenomenal sale of any accessory ever put on the market. It is the most logical and only safe device of its kind—is just a flexible, small coil chain, made of soft, tough wire, a special composition—90% copper.



Now used and recommended by many of the manufacturers.

Guaranteed to remove the carbon from a cylinder-top, sides and piston head—just poke the chain through a spark plug hole, cut off the ignition on this cylinder, then run the engine a couple of minutes with the power of the remaining cylinders.

You can clean two cylinders at the same time with two chains.

Always state kind of motor when ordering. Price, 75c; three for \$2. Postpaid.

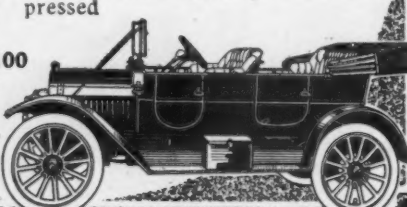
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Our Model 66 is one of a line of six pleasure cars designed and constructed to meet the demand for high-class cars of service at a moderate price. Model 66: Equipped with 35 h. p. ball-bearing motor, top, windshield, large substantial axles, heavy pressed steel frame.

Price \$1100  
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*We may reverse the Price - We will never reduce the Quality*


*The Knight Tire & Rubber Co. Canton O.*

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"The Car that made good in one day—Now Makes Good Every Day"

There is no necessity for you to pay more than \$2000 unless you want more than a high powered, four-cylinder car, built throughout of absolutely the best material known to automobile engineers. A 50 horsepower motor, 120-inch wheelbase, 34x4½ tires, genuine Stutz rear system, 1½-inch spokes in all wheels, Timken's best front axle—a few features of Stutz construction. Send for the "Story of the Sturdy Stutz"—an illustrated booklet giving also mechanical details. Ask for booklet A-2.

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Manufacturers of Stutz Cars  
Indianapolis, Indiana

**Food for Autos**

Lubrication is to the motor car what nourishment is to the human body. Both require the proper diet to do their best work. Each of the many

**Dixon Motor Lubricants**

is carefully prepared to meet some particular need of the motor car and fill that need as only a flake graphite lubricant can. Write for free sample and booklet No. 82-G.

**JOSEPH DIXON CRUCIBLE CO.**  
JERSEY CITY, N. J.

**Bower Roller Bearing Co.**  
Detroit, Michigan



Manufacturers of high grade roller bearings for all purposes. Our consulting Engineering Department is always at your service.

Send for catalog, price list and specification sheets of sizes.

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THE full Marion line includes a "33"—"35"—"46"—"47"—"48." These range in price from \$1150 to \$1850. It is the most practical, popular priced line on the market. Write for full information.

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Indianapolis . . . . . Indiana

BEST GRADE—**"CHROME VANADIUM"**



NEXT BEST—**"SPECIAL ANALYSIS"**

**"THOSE EASY RIDING CLEVELAND-CANTON SPRINGS"**

Both makers and purchasers of either personal or commercial cars will be interested to investigate, from our literature, why Cleveland-Canton Automobile Springs are so easy-riding, flexible, resilient, yet so strong and serviceable that under our rigid inspection and test system they will stand 40 tons pressure to the square inch without taking permanent set. Oil tempered—not merely oil flashed or water chilled. Address for prices (22)

**THE CLEVELAND-CANTON SPRING CO., CANTON, OHIO**

**Ohio**

The classiest and most exclusive model ever shown. The one distinctive car at all of the big exhibits.

Built on integrity and guaranteed for life.

The Ohio gives the most complete satisfaction to owners in every way, and puts net profits to the dealer's credit. Get the line today and learn the real pleasure of handling a truly remarkable car.



**GRAND PRIX**  
Two passenger Bullet Roadster, electrically lighted and including Self-Starter if wanted. . . . \$2500.00

**THE Ohio MOTOR CAR CO.**  
CINCINNATI, OHIO





Hilo De Luxe

WHEN IN DOUBT  
BUY—

TRADE MARK  
**ALCO**  
GERMAN  
LAVA  
BURNERS

Don't purchase cheap burners for your lamps. Buy the best. ALCO BURNERS are made of Genuine German Lava and they won't carbonize. Ask your dealer.

**AMERICAN LAVA COMPANY**  
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The car of Vanadium Steel.

The car which has won deserved popularity by reason of established merit.

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### Bulls' Eye Spark Plug

"The Plug With the Crystal Ports"



Shows at a glance dead cylinders and imperfect combustion. Aside from special features the best made spark plug on the market. Ports guaranteed against breakage. Order a set from your dealer or from us. \$1.25 each, charges prepaid on receipt of price.



"Why work in the dark?"

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STAMFORD CONN.

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Cellular or solid truck types—smooth or Keaton non-skid treads—stand pre-eminent in service, economy and long life. Their superiority has never been seriously questioned.

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Factory at Flint, Mich.

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MOTT CO.**

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Fully Equipped

Five  
Passenger  
Touring  
Car



25 H. P.  
Long  
Stroke  
Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform, Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car.

**BRIGGS-DETROITER COMPANY**  
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SIX CYLINDER

SELF STARTING

2 Models—Fully Equipped

40-45 H.P.—\$2,100.00

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Territory open for live dealers

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## Gear Cutting Transmission Gears Complete Differentials

We have the most complete facilities for handling this work. Quantity orders are our specialty.

**The NEW PROCESS** **N.P.R.H.** **RAW HIDE CO.**  
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(Tailor Made)



ARE acknowledged to be THE BEST. QUALITY CONSIDERED THEY ARE CHEAPEST.

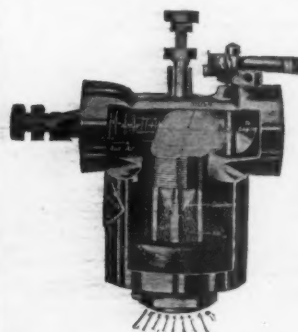
Used as Equipment by the Peerless Motor Car Co., F. B. Stearns Co.

NEW PRICES beginning March 1st.

Write for Catalog and Price List.

BANKER No. 3  
RAIN VISION

BANKER WIND SHIELD CO. PITTSBURGH, PA.



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CARBURETOR

Insures Speed,  
Power, Economy

Only two adjustments,  
which, once set, stay set  
—write for booklet.

Motor Appliance Co. of America

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## Abbott-Detroit 1912 MODELS

MODEL "44"

Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats.....	\$1800
Fore-door Demi-Tonneau, fully equipped, less top and windshield .....	1775
Fore-door Limousine, fully equipped.....	3000

MODEL "30"

Fore-door Touring Car, fully equipped, less top and windshield .....	\$1350
Fore-door Roadster, fully equipped, less top and windshield .....	1275
Colonial Coupe, fully equipped.....	2150

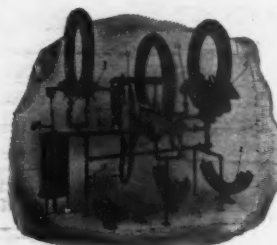
ABBOTT MOTOR COMPANY

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A WISE INVESTMENT SHOULD BE YOUR INVESTMENT



The Marble-Haywood Plants do not use air-bags, which have a high cost and a short life. The wonderful success of these plants lies in the use of Solid Pads and Clamps, by which means tremendous pressure is obtained. Write for Catalog B, illustrating our line of plants for 1912.

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**Jackson**  
No hill too steep  
No sand too deep

MODEL 52	\$1800
.. 45	\$1650
.. 32	\$1100
.. 26	\$1100
.. 28	\$1000

JACKSON AUTOMOBILE CO.  
1207 E. Main Street,  
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The Best and Easiest Way to repair the inner tube. Perfect Vulcanization in 15 minutes. All you need is one ounce of gasoline, a little specially prepared rubber and the

## Imperial Vulcanizer Repair Kit

It Gives You Practically

A New Inner Tube in 15 Minutes

Price \$3.50 Complete with enough rubber for 40 punctures. Sold on a guarantee of satisfaction. Nickel plated. Weighs only 3 lbs.

At your dealer's or sent by express

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# EISEMANN

Has Always Led

Ask us to tell you about the wonderful new pole pieces and the Automatic Control Magneto.

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\$1600

FORTY

\$1750

THIS 1912 detachable fore-door model is a handsome—powerful—economical car. Self starter, handbuffed leather upholstery—beautifully finished and completely outfitted with superb appointments. The car chosen by the Government for its western country work.

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Great Western Automobile Company

Dept. 20.

Peru, Indiana



### THE BERDON ELECTRIC LIGHTING SYSTEM

Offers complete electric lighting luxury—assured by a mechanically perfect product—and guaranteed for the life of a car.

Send for the story of the most exacting trial ever given an electric lighting system—"The Acid Test"—Sent free to any address.

**THE ESTERLINE COMPANY**

Engineers and Manufacturers  
126 Main St., La Fayette, Indiana

*Imperial*



**THREE ASTONISHING PRICES—  
SIX BIG FEATURES**

Model 44.....	\$1750	Four real doors, center control, silent enclosed motor, long stroke, demountable rims, big tires, long wheelbase.
Model 34.....	\$1400	
Model 32.....	\$1250	

IMPERIAL AUTO COMPANY, JACKSON, MICH.



**NO MORE SOOT IN YOUR  
SPARK PLUGS IF YOU USE  
ALL-IN-ONE**

JUST OPEN THE STOP-COCK AND OUT GOES THE SOOT

ALL-IN-ONE SPARK PLUGS have numerous other advantages. You can stop any knocking in your motor by priming here with a few drops of kerosene. You can instantly find any missing cylinder by turning the pet cocks. You can instantly prime your motor. All of these advantages are contained in ALL-IN-ONE SPARK PLUGS, and they cost no more than the other kind. \$1.50 each.

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### THE BORLAND ELECTRIC BROUGHAM

**Leads in Excellence, Elegance and Economy**

There is nothing better made in the electric car line. A long, roomy, beautifully finished body. Ample mileage. Easy and positive in control. Perfect in suspension. Cushion tires. Ball bearing axles. Low step—easy to enter and leave. Up-to-date in every particular—away ahead of the times in first cost and upkeep.

Made in three models each  
Chain and Shaft Drive.

*Some Splendid Territory Still Open*

**THE BORLAND-GRANNIS COMPANY**  
2634 Michigan Avenue Chicago, Ill.

NEW YORK • PENNSYLVANIA • MASSACHUSETTS • WASHINGTON • DELAWARE

**The Only Complete Car**

**Inter-State**

Electrically Self Started and Lighted

Six Models 40 & 50 H.P. Fully Equipped

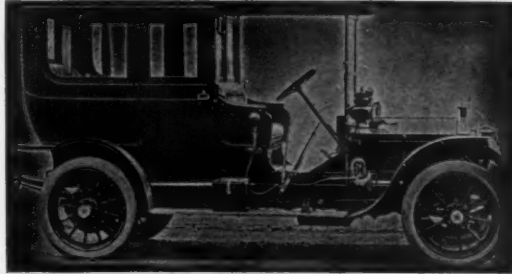
Model 40—5 Passenger, Fore Door Touring Car.	Model 50—7 Passenger, Fore Door Touring Car.
Model 41—4 Passenger Demi Tonneau.	Model 51—4 Passenger Demi Tonneau.
Model 42—Roadster type—all with the splendid new en bloc motor. 4½ in. bore 5½ in. stroke. 40 H. P. \$2400	Model 52—Roadster type—all with the new "T" head 5 in. bore, 6 in. stroke motor. 50 H. P. \$3400

Model 30-A—Fore-Door, a 40 H. P., 5 Passenger Touring Car at \$1750  
Model 32-B—A 40 H. P. Roadster at \$1700

All fully described in our Art Catalog. Send for one today.

**Inter-State Automobile Co., Dept. M, Muncie, Ind.**  
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KANSAS • DAKOTA • ALABAMA • NEBRASKA • IDAHO • VERMONT



**SPRINGFIELD METAL BODY CO.**

Builders of  
**HIGH-GRADE METAL BODIES**

378 BIRNIE AVENUE, SPRINGFIELD, MASS.

**DAVIS MOTOR CARS**



Model 40-B Four Pass., \$1850

**FOUR DIFFERENT MODELS**

Model 40 Five Pass.....	\$1850	Model 40-B Strictly Four Pass.....	\$1850
Model 40-A Medium Size Five Pass.....	\$1850	Model 40-C Roadster.....	\$1850

Equipped with top and curtains, windshield, speedometer and clock, five lamps, Prest-O-Lite tank, tools, pump, jack, Continental long stroke motor, Bosch High Tension Magneto, full floating axle, demountable rims, 36x4 tire. Prest-O-Starter and Electric Lights when wanted.

Write us for our catalog and agency proposition  
**GEORGE W. DAVIS CARRIAGE CO., Richmond, Indiana**



**THE WINCHESTER**  
of OIL and GREASE GUNS  
*The* **WISCO**

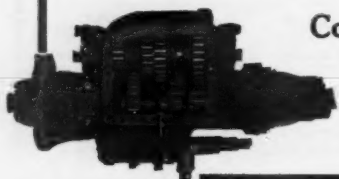
No motorist's equipment is complete unless it includes the Wisco Oil and Grease Gun. Because of its flexible spout, which makes it possible to use it at any angle, the Wisco is the most convenient grease gun on the market. Dealers—If you want an article that sells on its merits and will put money in your pockets, you should stock the Wisco Grease Gun.

Send for our catalogue  
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Passaic, N. J.

## COVERT TRANSMISSIONS

for commercial cars have always proven successful.

They will stand the severest tests and all we ask of you is to let us demonstrate this fact on your own car. Your inquiries will be given every consideration.



**Covert Motor Vehicle Co.**

Sales Office: Ford Building,  
Detroit, Michigan

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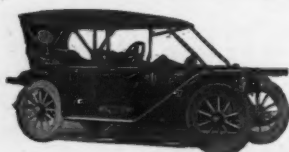
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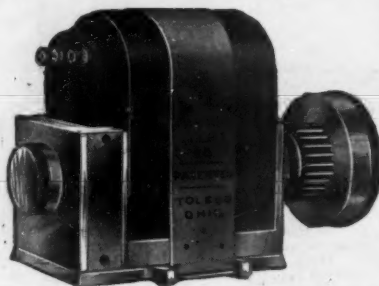
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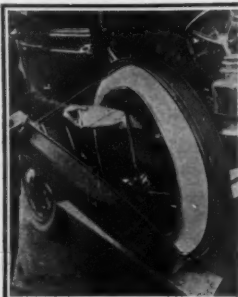
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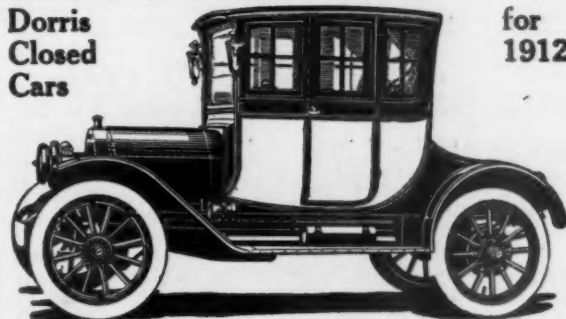
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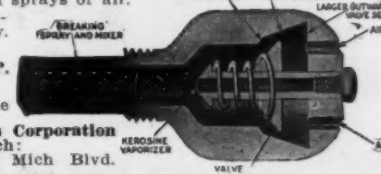
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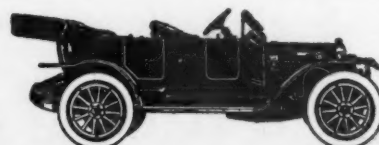
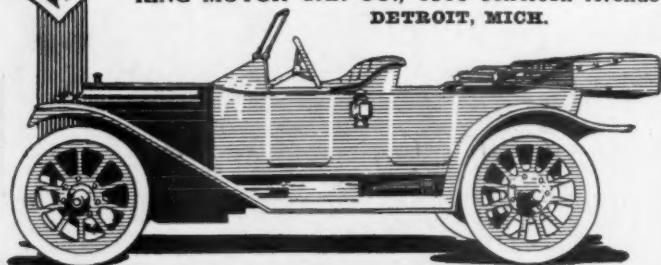


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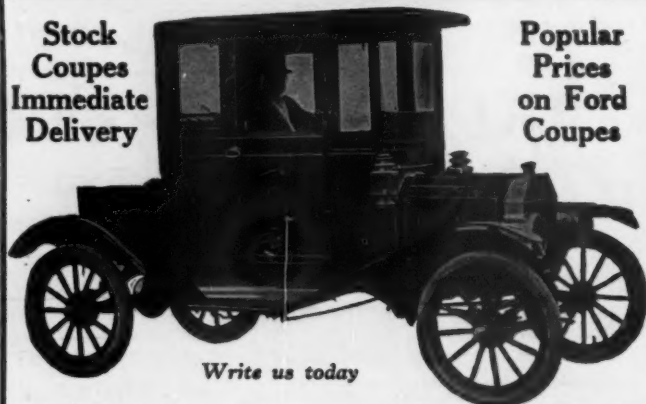
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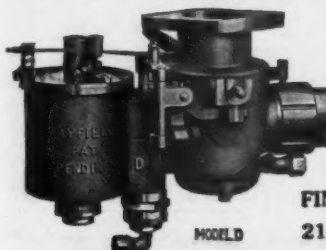
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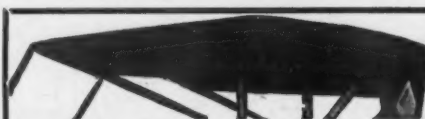
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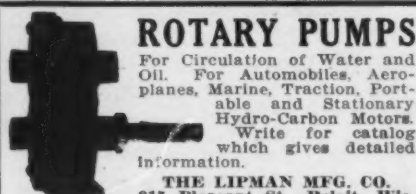


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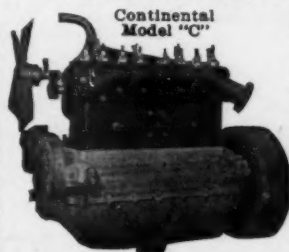


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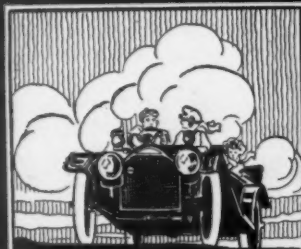


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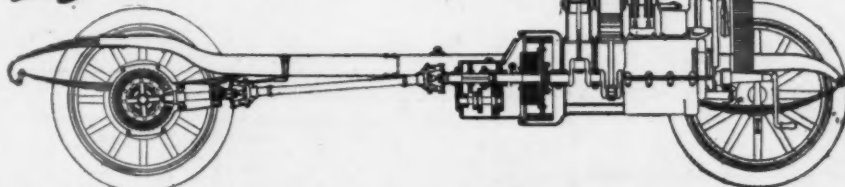
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**FRANKLIN AUTOMOBILE COMPANY, Syracuse, N. Y.****SHAWMUT TIRES**  
**SHAWMUT TIRE CO., - - BOSTON, MASS.***When Writing to Advertisers Please Mention Motor Age.*



# CLASSIFIED ADVERTISEMENTS

Rates for advertisements under this heading, 20 cents per line per insertion. Each line contains about six words. Please send remittances with order.

## Cars For Sale

**A BARGAIN—FIVE-PASSENGER TOURING** car; nearly new; complete with top, windshield and all accessories. New Kelley Springfield tires; Bailey tread and Prest-O-Lite gas tank. All in excellent condition. We are asking half price for car. The Triumph Electric Company, Cincinnati, Ohio.

**A BARGAIN—MAXWELL RUNABOUT, A1** condition; almost new, \$375.00. P. G. W. Ganger, Warsaw, Ind.

### A. C. C. A. PRICES TALK!

Great opportunity for dealers to stock up. Hundreds of Runabouts, Roadsters, Touring Cars, Limousines sacrificed. Here's some bargains offered: (50) Runabouts—Reo's, Oldsmobile's, Ford's, Cadillac's, Northern Long Distance, \$50. (10) Light five passenger touring cars—Buick's, Reo's, Cadillac's, Maxwell's, Autocar's, White Steamers', Rambler's, Jackson's, \$100, \$175. (26) Three and 4-passenger Roadsters and Speedsters—Buick's Ford's, Stoddard-Dayton's, Thomas' Pierce-Arrow's, \$200 upward. (14) Five and seven passenger touring cars, most of them leading French and German makes, \$500 upward. (21) Limousines, Landaullets and miscellaneous taxi-cabs at our own price. We Guarantee every car! We prepay Freight! Write today for our latest Illustrated Catalog, the largest and most complete price list of its kind ever published! The Automobile and Cycle Company of America, Dept. JJ, 1769-1787 Broadway, New York City.

**A LATE WHITE STEAMER 40 H. P., 7-** passenger, just like new in every particular and finely equipped. Cost \$4,800. Will give big bargain. Also have an engine and boiler and some other parts for sale. Address Box C 906 care Motor Age.

**A RAPID 18-PASSENGER AND THREE** Oldsmobile 24-passenger sight seeing cars at a bargain if taken at once, cash only. All four cars recently overhauled and in good running order. Dietzsch Sight Seeing Co., 83 Woodward Ave., Detroit, Mich.

**A RARE BARGAIN, 1910 THOMAS, 6-70** touring car; run less than 15,000 miles. Overhauled at factory in Buffalo and run less than 100 miles since. In fine mechanical condition; beautiful in appearance, and equipped with combination electric side and tail lights. Large Prest-O head lights, Klaxon & Reed horns; \$125 combination Warner speedometer and clock, \$85.00 wind shield, electric cigar lighter, demountable rims. Tires on car 38x5½", run about 100 miles, with two brand new extra tires, four brand new extra tubes; full tool equipment. Original cost of outfit \$6,800; will sell for \$1,800. Address Box C 905, care Motor Age.

**AUTOMOBILES—SAVE DEALERS' PROFITS,** buy direct from the owners. I have all makes on my lists. Runabouts from \$50 up. Touring cars from \$100 up. Get my price before purchasing. King Automobile Broker, Dept. M. A., 217 West 125th St., New York City.

### AUTOMOBILES

The rebuilt kind

The car you want

The price you will pay if it is on the market  
Write us for the car you want  
The M. E. Dalton Company, Inc.,  
1462-64 Michigan Ave.,  
Chicago.

Reference:

Corn Exchange Natl. Bank, Chicago.

**AUTOS, SECOND HAND, AT YOUR OWN** price. Also repairing of all kinds. Write for particulars. Oliveros & Laroche, 215 West Oglethorpe Ave, Savannah, Ga. Phone 1200.

**A 1911 ELMORE TOURING CAR; COST** \$1,500; full equipment; guaranteed in fine condition; like new; great roadster; a big bargain; send for price and description. H. J. Daniels, Norwich, N. Y.

**BARGAINS IN MITCHELL USED CARS** Taken in exchange for 1912 models. Rebuilt—Repainted—Guaranteed. Prices from \$250.00 up. Send for list. Mitchell Automobile Co.  
2334-36-38 Michigan avenue, Chicago.

**BIG SNAP—1911 MODEL 27 CAMERON 5-** pass. car for sale; fully equipped and good as new; not run over 400 miles; no reasonable offer refused. "Seller," 309 2nd Ave., Baraboo, Wis.

**BUICK ONE-TON TRUCK WITH 20-H.P.** motor, standard delivery body. Just overhauled and put in first class condition; \$400. Address Box C 884, c/o Motor Age.

### BUILD YOUR OWN GARAGE

Material Cost \$120.00

Complete set of working drawings, bill of material and specifications sent on receipt of \$1.00. Money refunded if not satisfactory. P. O. Box 114, Oak Park, Ill.

### BARGAIN CENTER OF THE WORLD.

For Bargains in Used Automobiles.

Autos bought, sold and exchanged.

White Touring Car.....	\$175
Buick Model 10 .....	325
Ford 1911, 5-passenger .....	425
Buick 10, 5-passenger .....	425
R. A. C., 6-cyl., 5-passenger.....	500
Jackson 1911 Toy Tonneau .....	500
Palmer & Singer town car, 1911.....	900
Mitchell 1911, 4-passenger.....	500
Pierce-Arrow, Fore Door, 7-passenger.....	600
Warren Detroit, Fore Door, Roadster... ..	550
Schacht Delivery Wagon .....	225
New Commerce, covered delivery, list price \$1,000; our price .....	600
Rambler, 5-passenger .....	150
Electric Runabout, no battery .....	60

And 100 other Bargains.

New Mohair Top. We can fit any 5-passenger or 2-passenger car. Regular price, \$50 to \$100. Our price.....\$15 to \$25  
All Brass Windshields, clear vision. Regular, \$30 to \$50. Automatic, \$9.00 to \$13.50.  
Radiators, all sizes.....\$15 to \$30  
High grade Speedometers. Price \$7.50 each.  
New 1911 Splittorf, 4 unit coils. Regular price, \$38. Our price.....\$18  
New Elseman, Dow & Bosch magnetos. Regular price, \$75 to \$150. Our price, \$20 to \$30.

\$2.50 Road Vulcanizer.

Vulcanize your own inner tubes.

Agents wanted in every town—can make from \$5 to \$25 a day.

Send for booklet describing it in detail.

Also send for automobile list.

Mail orders filled same day as received.

Times Square Automobile Co.

1332-34 Michigan Ave., Chicago, Ill.

After May 1st Our Address will be 1210 and 1213 Michigan Ave.

**CADILLAC "30" \$850—TOURING CAR.** 1910 model, in fine condition, thoroughly overhauled, repainted, complete with dual ignition system, full equipment of lamps, wind-shield, top, curtains, speedometer, Prest-O-Lite tank, tools, etc. S. Breakstone, 1712 Michigan Ave., Chicago, Ill.

**CADILLAC 1909 LIMOUSINE WITH EX-** tra body, fine condition, used very little, trimmed in grey, whip cord; \$975.00. 834 E. 43rd street, Chicago

**CHALMERS 1910 TOURING CAR, COM-** plete equipment, excellent condition; only cash offers considered.

Packard Motor Car Company of Chicago  
2357 Michigan Ave.  
Chicago

### DO YOU WANT A BARGAIN

That is a Real Bargain

In a High Grade Factory Rebuilt Car?

This is the announcement of a "Bargain Sale" in automobiles. Not shop-worn goods sold at the end of the season when nobody wants them—not cheap cars fixed up to run for a little while and then crumble up and disappear in the scrap heap—not cars made by a factory without any reputation to maintain—but Real High Grade, High Powered, High Priced Thomas Cars, rebuilt by the factory that originally made them, and with that factory back of them, with the same guarantee as a new car and the price in many cases less than one-third the original cost. In fact, some of these cars cost us more than fifty per cent of the present price in the actual cost of the new material and labor which entered into their rebuilding.

Tell us just what you want in a motor car and we'll pick out the car we have nearest to your specifications and give you an exact statement of its condition.

We don't want to sell you if we can't give you absolute satisfaction.

E. R. Thomas Motor Car Co.  
Buffalo, N. Y.

**FOR PROMPT SALE "STANLEY STEAM-** er" 1910 roadster, overhauled and repainted, \$360. Chas. Rennie, private owner, 87th and Emerald, Chicago. Phone, Gresham 494. No trades.

**FOR SALE AT A BARGAIN, A RENAULT** 30-35, 1909, with open seven-passenger body, and Brewster Limousine body. Write Stutz Auto Parts Co., 221 West 10th St., Indianapolis.

**FOR SALE—DELAUNAY BELLEVILLE, AN** opportunity to get a slightly used automobile where quality and individuality are wanted. Will demonstrate. Harry S. Devenau, 484 Convent Ave., New York City.

**FOR SALE—HUDSON 5-PASSENGER 1911.** Fully equipped. First-class condition. Bargain. \$1,000 cash. Chas. Dulin, Ottumwa, Iowa.

**FOR SALE—MITCHELL SIX-CUTTING** Forty. For information, address owner, 119 Railroad Ave., Carnegie, Pa.

**FOR SALE—MODEL 26, 1911, BUICK** roadster, four cylinder, selective transmission. Run 2200 miles. First-class condition. Will give reason for selling.  
O. N. Bostwick,  
Mt. Sterling, Ohio.

**FOR SALE—ONE CHALMERS "30" TOUR-** ing car, 1911 model, with top and glass front; good condition; will repaint; a bargain. J. I. Martin, 415 Hibbard Ave., Detroit, Mich.

**FOR SALE—ONE SCHACHT 2-PASSENGER** car, almost new, \$300 if taken at once. Knut Jellom, Inwood, Ia.

**FOR SALE—ONE 2 CYLINDER REO** touring car, in fine condition; has good tires, 1 extra casing, 2 extra tubes, Prest-O-Lite tank, wind shield and top. Price, \$265.00. One single cylinder Reo runabout in good condition. Price, \$90.00. Address, Box C 899, care Motor Age.

**FOR SALE OR TRADE—MY 30 H. P.** Queen touring car; cost \$1,600; fine condition; fully equipped. C. H. Paddock, Pana, Ill.

**FOR SALE—REBUILT AND NEWLY** painted 4-cylinder Stoddard-Dayton car, and 1—6-cylinder rebuilt Premier. Mr. Malloy, 4937 Michigan Ave. Phone 3378 Cal., Chicago

**FOR SALE—WHITE STEAM CARS, VARI-** ous models, in excellent condition; also parts for steamer engines and generators. We specialize in steamers. Libal, 3145-53 N. Halsted street, Chicago.

**FOR SALE—6-CYLINDER 6-PASSENGER** touring car, first class condition; details and prices address Williams, White & Co., Moline, Ill.

**FOR SALE—7-PASSENGER MITCHELL** touring car, fully equipped electric headlights, for \$1,000; Cadillac 5-passenger fully equipped, \$800; Paige-Detroit roadster; all cars thoroughly overhauled and repainted. Stacey Motor Car Co., Elmwood Place, O.

**FOR SALE—7-PASSENGER MITCHELL** touring car, fully equipped; electric headlights; just thoroughly overhauled; also Paige-Detroit roadster. Stacey Motor Car Co., Elmwood Place, O.

**FOR SALE—1911 STEARNS 15, 30-H.P.** light touring car, with Guyven body, battleship gray color with white striping; demountable rims, 2 extra rims, 1 extra tire, speedometer, fully equipped and guaranteed in first class condition; has been run about 6,000 miles; price, \$2,100. If interested send for photo to Auto, P. O. Box 82, Milwaukee, Wis.

**FOR SALE—1911 STEARNS 15-30 TOURING** car, 5-passenger, costing fully equipped \$3,700. Run 7,000 miles. Perfect condition, guaranteed. Price, \$2,200.00 cash only. Your mechanic will say this car runs better than any new car. Edward Reiss, D. D. S., Terre Haute, Ind.

**FOR SALE—\$900 WINTON SIX '09 5-PAS-** senger automobile. Inquire J. O. Horton, Warren, Pa.

(Continued on page 132.)

When Writing to Advertisers, Please Mention Motor Age.

(Continued from page 131.)

**I HAVE 1912 STUDEBAKER LARGE 4-seated electric coupe;** Motz tires; has not run 1,000 miles; will sell cheap; leaving city. A. Freschl, 1200 Michigan Ave. Phone Calumet 197, Chicago.

**KEEP YOUR**

Automobile

In your own yard in a

Karr Garage.

Will cost you less than one year's storage. We build all sizes in frame or steel substantially constructed—artistically designed. Send for catalogue and price list. Karr Portable House Co., 2554 Irving Park Blvd., Chicago.

**LARGEST DEALERS IN HIGH GRADE** used autos for business and pleasure, also supplies. What have you to offer? Commercial Auto & Repair Co., San Antonio, Tex.

**LOZIER TYPE H 4-CYLINDER TOURING** car; absolutely new; demountables, regular guarantee and equipment. Address Smith, 1408 Olive St., St. Louis, Mo. m

**MARQUETTE BUICK ROADSTER, PRACTICALLY** new, very fast, smooth running, built so well she will last a lifetime; only \$1,000.00. M. A. Kent, Kenosha, Wis.

**MARMON 32, FIVE PASSENGER 1911 CAR;** top, windshield, speedometer, extra castings, tubes, chains, tire carrier, Klaxon; first class condition; bargain. Address Box C 667, c/o Motor Age. h

**OLDSMOBILE AUTOCRAT, 4-PASSENGER** Tourabout, 1911 model. Fully equipped, newly painted and overhauled. \$2,000.00. W. G. Welton, 634 Walnut Street, Cincinnati, Ohio. o

**ONE PIERCE-ARROW 36, 5 PASSENGER,** \$2,400.00; one Pierce-Arrow 48, 7 passenger, \$3,000.00. Rebuilt, revarnished; perfect mechanical condition. Cape top, glass front, speedometer, bumper, full equipment. 1526 Grand Ave., Kansas City, Missouri. d

**ONE 7-PASSENGER, LIMOUSINE AND** an extra open touring body, Buffalo Thomas Flyer, 60 h. p., just newly painted. This car was owned by one of Detroit's best families and has been kept in good shape. Tires on car mostly all new and two extra tires. This car cost \$6,300.00 when purchased. \$1,500.00 takes it. Good car for livery or family use. Inquire personally or write.

Rapid Motor Sales Co.,  
Detroit, Mich. d

**ONE 1912, MODEL 37 ELMORE CAR** equipped with top and shield, that we will sell at a sacrifice, and guarantee it to be brand new as the car has never been run a mile.

Two Model 36, 1911, Elmore cars with new 1912 motors, equipped with top, shield and Prest-O-Lite tank.

One 1910 7-passenger Elmore car equipped with demountable rims, Warner speedometer, \$150.00 top, \$80.00 Banker wind shield. Car has been run 1,400 miles; guaranteed. Will sell at a sacrifice.

We have given up the Elmore agency and must dispose of the above stock to the buyers, who are looking for bargains. If interested, kindly write to us for our best prices. Poffinberger Motor Car Co., 725 Ross Ave., Pittsburg, Pa.

**POPE-HARTFORD, FORTY, 5 PASSENGER,** cape top, glass front, speedometer, bumper, full equipment. Nickel plated. Perfect mechanical condition; first-class appearance. \$1,000.00. 1526 Grand Ave., Kansas City, Missouri. d

**THREE 24-PASSENGER SIGHT SEEING** cars for sale cheap, if taken at once. All in good condition. This is a snap for some one to make big money at the sight seeing game. Write or call personally and see them.

Rapid Motor Sales Co.,  
Detroit, Mich. d

**THREE 24 PASSENGER "SIGHTSEEING"** automobiles and 60 h.p. truck; all in fine shape; cost over \$12,000; price \$5,000. Addison, 35 S. Dearborn St., Chicago, Ill.

**THIRTY-FIVE PER CENT DISCOUNT** from list on remaining stock of used cars. Also snaps in second hand cars. Box 275, Burlington, Wis. a

**RECONSTRUCTED**

Pierce-Arrow Cars

During the process of rebuilding a Pierce-Arrow car, every new part that replaces an old one comes from the stock room at the Pierce-Arrow factory, and every stroke of labor in making the car practically a new one is according to Pierce-Arrow standards and rules. There is no guessing at measurements, fittings or material. No makeshifts are tolerated. The reconstructed car, when it is ready for sale, has been made again into a guaranteed model by precisely the same system that first completed it as a new Pierce-Arrow.

Several of the 36-H.P. and 48-H.P. five and seven-passenger reconstructed touring cars are now ready for delivery.

Write for specifications and price.

Other makes of cars taken as part payment.

Pierce-Arrow Sales Co.

756 Main St.

Buffalo

**TOUR EUROPE—FOR SALE—MY 50 H.P.** Flat (now in England); completely equipped for European tour; absolutely good as new; would cost \$5,000 to duplicate in England. Am returning to America with family and will accept \$3,000; July delivery in England. Photos and particulars at address below. An exceptional opportunity to any one contemplating European tour. Also 10 h.p. four speed "Isotta" runabout. James L. Mead, care of Mead Cycle Co., 35 N. Canal St., Chicago.

**WINTON CREDIT. GOOD AT ANY WINTON** agency on 1912 car. \$800 for \$575. Box C 901 care Motor Age. f

**"WINTON SIX" BARGAINS**

Used Cars

1909 Model, 48-H.P.

1910 Model, 48-H.P.

1911 Model, 48-H.P.

Winton Motor Car Co.,

Broadway and 70th St., New York City, N. Y.

**SIMPLEX 7-PASSENGER TOURING CAR,** double chain drive, mechanically perfect. Bosch magneto, Prest-O-Lite, wind shield, electric horn; very complete equipment. Top, paint and tires in fine shape. This is a light 7-passenger car and for extremely hard service, such as livery, etc., cannot be beat. Cost over \$7,500.00. Our price \$1,100.00, guaranteed. Stauber Bros. Auto. Co., Streator, Ill.

**1910 MODEL M THOMAS FLYER**

I have on hand one 1910 model M 6-40 Thomas Flyer 5-passenger touring car, taken in on a trade; thoroughly overhauled, all worn parts replaced with new parts, repainted, and new tires put on all around; car fully equipped with top, wind shield, speedometer, shock absorbers, full set of tools, lamps, Prest-O-Lite tank, etc.; first check for \$1,750 takes this car; will gladly make a demonstration to any one interested. Call or address,

Ewell Nalle, Agent Thomas Flyers,  
Austin, Texas.

**1911 40 H.P. WHITE 7-PASSENGER GASOLINE** touring car. Fully equipped and in excellent shape, at a bargain. The White Co. Used Car Dept., 2635 Wabash Ave., Chicago. Phone Cal. 5311.

**1911 BAKER ELECTRIC 4-PASSENGER** extension coupe, run less than 500 miles, cost \$2,900 with rectifier. For quick sale, \$1,800. Lake County Bank, Madison, S. D. w

**1911 CHALMERS ROADSTER, FULLY** equipped; 2 rumble seats, Bosch magneto, top, electric lights, wind shield; cost \$2,000, to close, \$1,000. R. S. Mattoon Motor Co., 2015 Michigan Ave., Chicago.

**Cars Wanted**

**FORTY ACRES GOOD POTATO LAND IN** Gladwin county, Michigan, for two, four or five-passenger automobile in good condition. O. Morgan, Box 481, Oakland City, Ind.

**RUNABOUTS AND TOURING CARS** Wanted.

Boston Auto Exchange,

8 Waltham St., Boston.

If you have a car to sell, see us before going elsewhere, as we are in a position to get more out of your car than any other dealer; drive over your car and let us figure on it, or drop us a card.

**WILL BUY A FORD MODEL T OR OTHER** Similar car. C. Larson, 1334 Michigan Ave., Chicago.

**24 TOWN LOTS IN NEW TOWN OF GRAN-** field, Okla. Good five roomed Bungalow, good rents, Burkburnett, Texas; equity in 75-acre River Valley farm; all to exchange for late model first-class automobiles. Staley & Ramming, Burkburnett, Texas.

**For Sale or Exchange**

**FOR SALE OR EXCHANGE—1910 RUTH** auto buggy, new, has run less than 100 miles; absolutely perfect condition; value, \$275, for motorcycle or piano. M. S. Daniels, Leesburg, Ind.

**SPLENDID WHITE STEAMER ONLY** \$225.00; perfect order, five good tires and extras. Runs beautifully. Exchange for Model T Ford Roadster. Demonstration given and required. Trippe, Toms River, N. J.

**WANT TO TRADE MY 1911 WINTON** Six, fully equipped including electric lights. Run six thousand miles, looks like new, for real estate located in Southern Indiana or Ohio. W. D. Bradt, Brookville, Ind.

**Parts and Accessories  
FOR SALE**

**AA1 IS THE RATING USERS GIVE** "Pacemaker Reinforcements."

Don't buy an inside tire protector until you see the "Pacemaker." Positively prevents punctures and blowouts.

28x3, \$3.50.	30x3 1/2, \$4.50.	32x4, \$5.50.
30x3, \$3.75.	32x3 1/2, \$4.75.	34x4, \$6.00.
32x3, \$4.00.	34x3 1/2, \$5.00.	36x4, \$6.25.

Guaranteed 10,000 miles; doubles the life of tires. Dealers wanted.

Write today for descriptive circular.

The Auto Tire Brokerage Company,  
1355 Michigan Ave., Chicago.

**A BATTERY BARGAIN.**

\$18 Storage Batteries \$7.50 while they last; 6 volt, 80 amp. guaranteed. Also Buick touring body and top. 240 E. 33rd St., Chicago.

**ALUMINUM MATTING FOR AUTOMOBILE** floor boards and running boards. Replace your worn-out matting with Pyram Aluminum Matting. Will not rust, stain or tarnish. Will outlast any car. Send for samples. Metallic Automobile Matting Co., 279 Mill St., Rochester, N. Y.

**ALUMINUM SOLDER FOR CRANK CASES** or Aluminum ware. Guaranteed. Bankable references. No fraud. Send \$1.50 to W. F. Smith, Ainsworth, Neb.

**ATTENTION—AUTOMOBILE OWNERS,** Second-Hand Dealers, Garages and Repair Shops—Get our new catalogue showing prices of accessories and supplies on hand, consisting of coats, caps, clocks, road maps, goggles, robe, auto trunks, tire covers, robe rails, horns, horn tubes, coca mats, wind shields, generators, brake lining, steel balls all sizes, hose clamps, tools, wrenches, screw drivers, etc. Closing out large stock of accessories and supplies at 50 to 100 per cent below cost. Buick Motor Co., Indianapolis, Ind.

**ATWATER-KENT 6-CYLINDER SYSTEMS** complete with bevels and shafts \$30.00. Get our big new list. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age.



**AUTOMOBILE WHEEL WATCH FOBS,** 50c; \$4.50 dozen. Greatest advertiser in the world. The Brokerage Co., Box 180, Logansport, Ga.

**AUTO PENNANTS, ANY DESIGN, SIZE** or quantity desired from one to a thousand; prices low. Sample pennants made, 50c each, with your own design. Anthony, the pennant man, Minneapolis, Minn.

**AUTO TIRES DO TRIPLE SERVICE WITH** Goodman's "Abestos Tire Shields;" keep inner tubes cool; no blowouts. S. Goodman & Co., 130 West 26th St., Bayonne, N. J. Agents wanted. Territory given.

**AXLES, TIMKEN—FRONT, COMPLETE** with hubs, hub caps and bearings, \$25.00; Timken rear axles, complete, \$125.00. New goods. Get our big list. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

#### BARGAINS FOR CASH

Only a Few Left

Reo mohair tops, 1910 or 1911.....\$37.50  
Ford rubber tops, 1910 or 1911..... 31.20  
Rubber hoods for either cars..... 2.85  
L. D. Thorp, Somonauk, Ill.

**BARGAINS IN HIGH GRADE PANEL TOP** delivery bodies with doors in rear. We have a quantity to close out, \$70.00 to \$100.00. Write for prints and particulars. The Barndt & Johnston Co., Columbus, Ohio.

**BARGAINS IN NEW 3 1/2x4 1/2 AND 4x5** four-cylinder motors. F. E. Alford, Goshen, Ind.

**BARGAIN—1/4 H. P. 110 VOLT, DIRECT** current motor, used 1 month. Also 1 new Vul-Car vulcanizer. F. W. Lindig, Lewisburg, Pa.

**BODIES—NEW TOURING AND CLOSE** coupled, painted and upholstered, \$50.00; second hand touring bodies, \$20.00. Get our big new list. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

**CARBURETORS—KINGSTON FLOATING** ball, single adjustment, carburetors, 1 1/4-in. vertical intake, new, \$5.50; coils, 4-cylinder Heinze, complete with large kick switch, \$16.50. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

#### CERTAINLY

We have a Dandy Catalogue filled with all kinds of valuable information. You cannot afford to be without it. A postal will do. Write now.

Pacific Leather Works  
239 12th St., Oakland, California.

**CHARGED ACETYLENE GAS TANKS,** with brackets, key and connection, complete, \$10.00 each. Fred Allen Automobile Supply Co., 1610 Michigan Ave., Chicago.

**COMPLETE LINE OF REPAIRS FOR ALL** models Oswald motors. F. E. Alford, Goshen, Ind.

#### DRAGON REPAIR PARTS.

We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel street, Philadelphia, Pa.

**E. M. F. PUSH ROD ADJUSTERS, \$1.50,** for complete set delivered. Money back guarantee. Auto Parts Co., Providence, R. I.

**FORD AGENTS, WE MAKE A SPECIALTY** of dust hoods to cover top when clashed down for Model T. Ford 1910, 1911, 1912 cars. Write for prices. Will save you money. The H. A. Hawes Storm Front Co., Coldwater, Mich.

**FORD OWNERS—A POSTAL BRINGS YOU** our 1912 catalog of 22 necessities for your car. Auto Parts Co., Providence, R. I.

**FORD OWNERS—GARDNER TRUSS,** Gardner Auxiliary Engine Base and Gardner Quick Attachable Ball Bearing for Ford "T" cars. Manufactured by Gardner Engine Starter Co., Inc., 1455 Michigan Ave., Chicago, Ill. Two years on the market. Carried in stock by John F. Revalk, 563 Golden Gate Ave., San Francisco, Cal.; Kansas City Auto Sup. Co., Kansas City, Mo.; Auto Parts Company, Providence, R. I.

#### FORD OWNERS

Send us a postal and we will mail you our 1912 catalog, containing many new and useful "specialties" for Ford cars. Auto Improvements Co., 53-H Court St., Bristol, Rhode Island.

**FORD OWNERS—TOWNSAN VALVE AD-**justers are the simplest, surest and lightest silencers in the world. Price, \$1.50 by mail. Townsan Auto Specialty Co., Mitchell, S. D.

#### FORD OWNERS.

We have two new Ford Commercial Roadster Bodies and Tops for sale cheap. Auto Remodeling Co.  
1827 Michigan Ave., Chicago.

**FORE DOORS FOR BUICK 10. NEVER** used. \$15 cash. Chas. Dulin, Ottumwa, Iowa.

**FOR SALE AT BARGAIN—RETRADING** kettle and 5 h. p. boiler in first-class condition, used very little. Miss. Elec. Co., Vicksburg, Miss.

**FOR SALE—BOTH AXLES, TRANSMIS-**sion and wheels from Premier Model 24. Transmission bought new last fall. All in fine condition. Very cheap. Also extra heavy second hand radiator and steering gear. Few new magnetos cheap. F. E. Alford, Goshen, Ind.

**FOR SALE—COMPLETE 30 H. P. WHITE** steam power plant. Box C 908, c/o Motor Age.

**FOR SALE—COUPES FOR IMMEDIATE** delivery. Stylish, up-to-date and well constructed. Fit almost any car. Write us. Robbins & Co., Indianapolis, Ind.

**FOR SALE—FISHER GASOLINE ENGINE,** Tandem air compressor; capacity 35 cubic feet free air per minute; 80 lbs. pressure; thoroughly overhauled; bargain, \$375; cost \$700 new. Christopher Murphy & Co., Peoples Gas Bldg., Chicago.

**FOR SALE—LIMOUSINE BODY 5-PASSE-**nger in fine condition. Box C 907, c/o Motor Age.

**FOR SALE—NEW UNIVERSAL DEMOUNT-**able rims, 5 to a set, \$10; 32x3 1/4; 34x3 1/4; 34x4; 34x4 1/4. Triple Action Spring Co., 215 E. 21st St., Chicago.

**FOR SALE—SHELBY TUBING BATTERY** boxes, spring clips, bell cranks, step irons, starting cranks, yoke ends, seven passenger bodies. Dolson car parts in stock. Dolson Auto Supply Co., Muncie, Ind.

#### HIGH QUALITY—GUARANTEED GOODS

At Prices That Talk

Dunk Way Pays

Do you know that your auto up-keep is from 30 to 50 per cent too high? Then think of Dunk, because we buy by carloads and many times entire output of factories. We own our own factory, a city block square.

Money Back Offer

If goods are not as represented, makes every one of our 26,310 customers an advertisement for us. Ask any auto fellow if

Dunk Way Pays

Ask Him How Much We Saved Him

Last Year

A Few Bargains

More to be had for the asking.

10 Warner Speedometers.....	\$ 27.50
3,510 Lamps.....up from	2.00
58 Magnetos.....	18.00
8,900 Battery terminals.....doz.	.10
57 Cadillac rear axles.....	70.00
58 Cadillac front axles.....	20.00
725 34x4 wheels.....	3.00
1,000 \$1.00 spark plugs.....	.33
67 Windshields, \$25.00 kind.....	11.50
31 Anhur radiators.....	13.50
438 Assorted Mufflers.....	2.05
32 Four-cylinder motors.....	225.00
1,310 Robe rails at.....	1.00
187 Foot rails.....	
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lights acetylene lamps from the seat while car runs; price, \$10. Agents wanted. Advance Motor Specialties Co.  
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30-h.p. vertical, 2-cyl.....\$ 75  
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Also the celebrated

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New 50-h.p. models; regular price \$750; our price \$250.

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(Continued on page 134.)

(Continued from page 133.)

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Just what you've been looking for. Prevent wearing unsightly holes in floor coverings back of pedals; or cover up holes if already there. These plates are made of special, extra heavy, tough aluminum, having  $\frac{1}{4}$ -in. pyramids with  $\frac{1}{2}$ -in. plain borders. Have a beautiful white satin finish, and are ornamental as well as useful. Actual size is 6 inches by 10 $\frac{1}{2}$  inches, with screw holes drilled, making it possible to attach them in one minute. Price, 75 cents delivered. Send stamps or coin today. Metallic Automobile Matting Co., 279 Mill St., Rochester, N. Y.

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Regular Price. Our Price.  
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Guaranteed Quality at Less Than

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Absolutely New Stock

Double drop frames.....\$ 21.00  
Suitable for cars weighing up to 3,000 lbs.  
Bodies, foredoor, painted and upholstered ..... 175.00  
Five to 7-passengers will fit above frames.  
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Will fit above frames.  
Springs,  $\frac{1}{4}$  and  $\frac{1}{2}$  elliptic, per set.... 18.00  
Front and rear best quality 2-inch, will fit above frames.  
Wheels, 34x4 demountable rims, per set ..... 27.00  
Complete except hubs.  
They Will Go Quick

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Economy Storage Battery, 6—60,  
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Position as Manager.  
Having been in the automobile industry for 12 years, in its various departments, I desire to keep going up. Can make good. Have never had to look for a position. Am connected at the present time. Have large acquaintance in Chicago. Will furnish satisfactory information if required.  
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This week we especially need—  
Factory Manager, General Manager, Superintendents, Foremen, Designers, Draftsmen, Assemblers, Machinists, Engineers, etc. Accountants, Bookkeepers, Stenographers, Correspondents, Cost Men, Timekeepers, Typists, etc.

If you can't call, write. Correspondence strictly confidential.

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**SALESMEN OF BROAD EXPERIENCE** who are continually active and expert, can make permanent connection with us either in city or country work.

The opportunity is an unusual one and live dependable men will be given every opportunity to make big money. Haynes Automobile Co., Edward Aaron Banschbach, Manager, 17th St. and Michigan Ave., Chicago.

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Good layout man, also ass't chief draftsman. Good chance for advancement for right man. State full particulars, age, salary, etc., in answer. Apply Mr. Allen, The Pope Manufacturing Co., West Works, Hartford, Conn.

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Michaud Repair Works  
Lamps, Windshields and Tanks a specialty.  
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(Continued on page 136.)

(Continued from page 135.)

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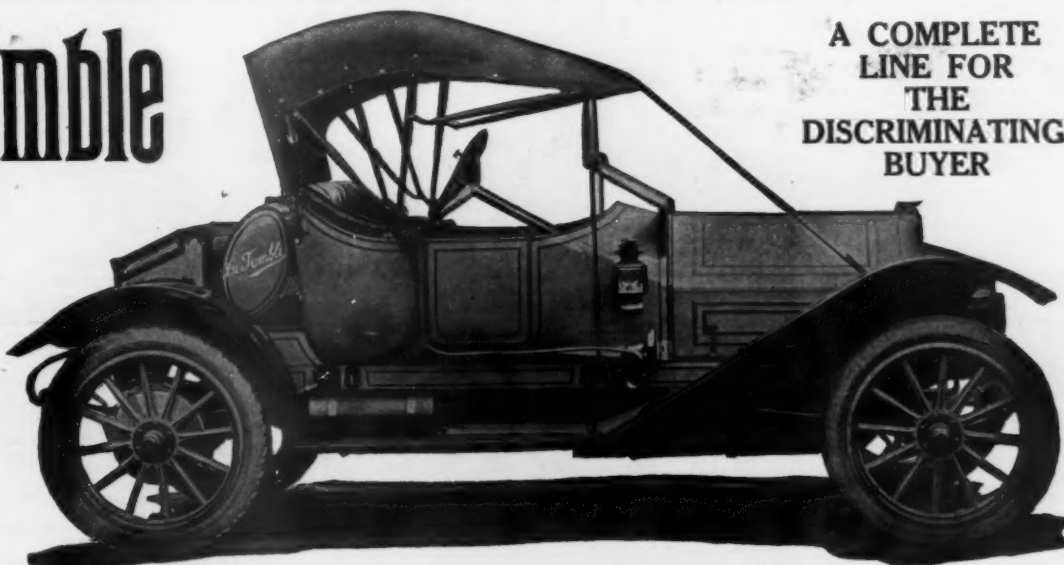
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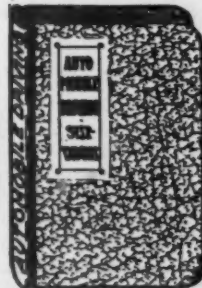
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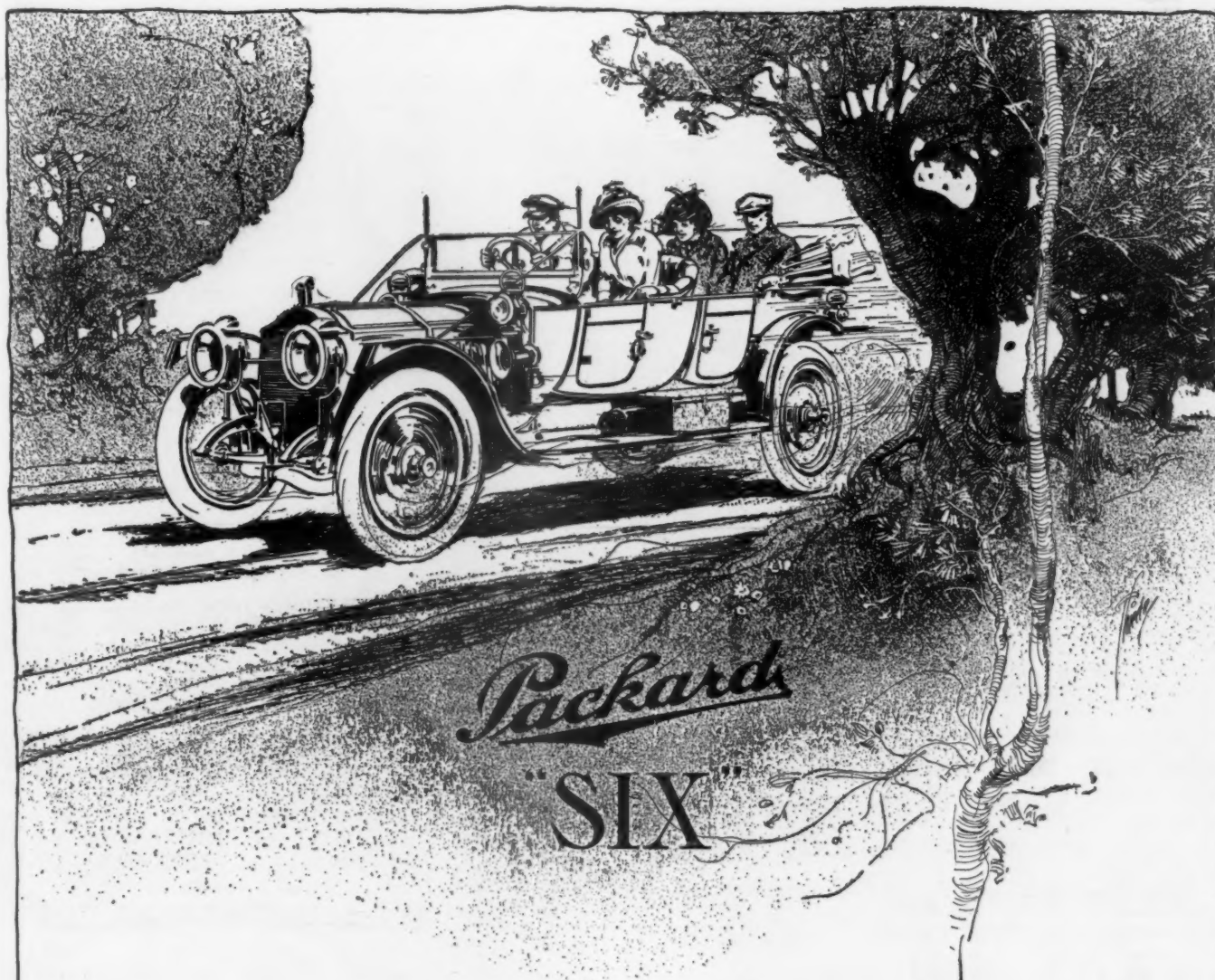
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## INDEX TO ADVERTISEMENTS

Acheson Graphite Co., International	120	Eagle Co.	115	La Fayette Engineering Co.	90	Robbins & Co.	128
Abbott Motor Co.	122	Eagle Oil & Supply Co.	128	Lauth-Juergens Motor Car Co.	109	Royal Equipment Co.	127
Ajax-Grieb Rubber Co.	106	Edison Storage Battery Co.	62-63	Leather Tire Goods Co.	118	Rushmore Dynamo Works.	126
American Ball Bearing Co.	118	Eisemann Magneto Co.	122	Lexington Motor Car Co.	130	Rutenber	98
American Lava Co.	121	Electric Auto-Lite Co.	124	Lipman Mfg. Co.	125		
American Motors Co.	124	Ellsworth & Thayer Mfg. Co.	129	Locomobile Co. of America.	110	Sager, J. H., Co.	108
American Starter & Carburetor Co.	114	Elmore Mfg. Co.	89	Long Mfg. Co.	55	Salisbury Wheel & Mfg. Co.	101
Ames Motor Car Co.	114	Empire Automobile Co.	126	Lovell-McConnell Mfg. Co.	114	Sargent, A. C., Son, Inc.	128
Andrews & Co., A. H.	4	Engel Co., W. A.	138	Lustre Mfg. Co.	114	Schrader's	119
Atlas Auto Supply Co.	125	Enger Motor Car Co.	113			Searchlight Gas Co.	130
Atterbury Motor Car Co.	104	Esterline Co.	123	McCue Co.	66	Selden Motor Vehicle Co.	101
Auburn Automobile Co.	113			McFarlan Motor Car Co.	121	Shaler, C. A., Co.	130
Austin Automobile Co.	87	Federal Rubber Co.	Cover	McGraw Tire & Rubber Co.	122	Shawmut Tire Co.	127
Automobile Blue Book Pub. Co.	96	F. I. A. T.	130	McIntyre, W. H., Co.	114	Sheldon Axle Co.	60
Automobile Supply Mfg. Co.	99	Firestone Tire & Rubber Co.	128	Manufacturers' & Dealers' Motor	70	Simkin Mfg. Co.	118
Autoparts Mfg. Co.	111	Ford Motor Co.	121	Fire Ins. Co.	70	Siren Co.	126
Auto Parts Mfg. Co.	138	Franklin Automobile Co.	130	Manufacturers' & Dealers' Motor	70	Speedwell Motor Car Co.	125
		Frontier Specialty Co.	123	Casualty Co.	99	Spicer Mfg. Co.	114
Badger Brass Mfg. Co.	138	G. & A. Carburetor Co.	85	Marathon Motor Works.	124	Spittdorf, C. F.	123
Baker Motor-Vehicle Co.	118	Gabriel Horn Mfg. Co.	103	Marion Sales Co.	120	Springfield Metal Body Co.	119
Banker Windshield Co.	122	Gardner Engine Starter Co.	60	Meili-Blumberg Co.	112	Standard Gauge Steel Co.	77
Barnes Co., W. F. & John	98	General Electric Co.	129	Mercer Automobile Co.	112	Start-Lite Co.	117
Barthel, Daly & Miller.	124	General Motors Truck Co.	88	Merchant & Evans Co.	124	Staves Mfg. Co.	127
Beaver Mfg. Co.	117	Gibney, Jas. L. & Bro.	114	Metz Co.	125	Staver Carriage Co.	125
Beck Co.	138	Gilbert Mfg. Co.	130	Michener, E. S.	119	Stearns, F. B., Co.	127
Beckley-Ralston Co.	108	Goodrich, B. F. & Co.	128	Michigan Buggy Co.	112	Stewart, Alfred C. Machine Wks.	110
Blickensderfer, G. C., Co.	121	Goodyear Tire & Rubber Co.	128	M. M. M. Co.	3	Streator Motor Car Co.	68
Borland-Grannis Co.	128	Gramm Motor Car Co.	113	Morris, R. W., Mfg. Co.	110	Stromberg Motor Devices Co.	76
Bosch Magneto Co.	2	Grand Rapids Motor Truck Co.	113	Motor Appliance Co. of America.	122	Studebaker Corporation	121
Bower Roller Bearing Co.	120	Grant Motor Car Co.	67	Motor Car Supply Co.	129		
Bowser, S. F. & Co.	109	Gray & Davis.	119	Motor Parts Co.	125		
Bretz, J. S., Co.	110	Great Western Automobile Co.	122	Motz Tire & Rubber Co.	136		
Bridgeport Brass Co.	71	Grossman, Emil, Co.	118	Muncie Gear Works.	138		
Briggs-Detroit Co.	121	Guide Motor Lamp Mfg. Co.	102				
Briggs Magneto Co.	136			National Motor Vehicle Co.	112	Thomas, E. R., Motor Car Co.	97
Broderick & Bascom Rope Co.	105	Ham, C. T., Mfg. Co.	107	New Department Mfg. Co.	83	Timken-Detroit Axle Co.	73
Buckeye Mfg. Co.	120	Hartford Suspension Co.	91	New Process Raw Hide Co.	121	Tingley, Chas. O., & Co.	129
Buda Co.	115	Havers Motor Car Co.	127	N. Y. & N. J. Lubricant Co.	69	Tobey, W. L.	188
Buob & Schen.	128	Havoline Oil Co.	84	Nordyke & Marmon Co.	110	Tuthill Spring Co.	128
Byrne, Kingston & Co.	86	Haynes Automobile Co.	Cover	Northwestern Chemical Co.	138	Twentieth Century Tire Protector Co.	116
		Haywood Tire & Equipment Co.	122	Norwalk Motor Car Co.	119		
Carbo-Light Co.	116	Heinze Electric Co.	116	Nyberg Automobile Works.	129		
Cartercar Co.	115	Henderson Motor Sales Co.	115			United Rim Co.	116
Champion Ignition Co.	112	Herreshoff Motor Co.	115	Oakes & Dow Co.	106	U. S. Gauge Co.	112
Champion Spark Plug Co.	70	Hess-Bright Mfg. Co.	92	Ohio Motor Car Co.	120	United States Motor Co., Front Cover	94
Chase Motor Truck Co.	124	Hoffecker Co., The.	80-81	Old Dutch Cleanser.	111	United States Tire Co.	117
Chicago Automobile Supply House	138	Holley Bros. Co.	128	Orcutt, J. C., & Co.	130	Vacuum Oil Co.	74
Clarke-Carter Automobile Co.	119	Hotel La Salle.	107	Owen, R. M., & Co.	72	Valentine, J. H., Co.	114
Classified	131-132-133-134-135	Hotel Woodstock.	107			Veeder Mfg. Co.	61
Cleveland-Canton Spring Co.	120	Hupp Motor Car Co.	117	Packard Electric Co.	124		
Colby Motor Co.	110	Hyatt Roller Bearing Co.	112	Packard Motor Car Co.	139	Warner Gear Co.	104
Colorado Tire & Leather Wks.	113			Page-Lester Co.	125	Warner Instrument Co.	125
Combustion Appliances Co.	117	Ideal Motor Car Co.	120	Pantasote Co.	103	Warner Mfg. Co.	106
Connecticut Shock Absorber Co.	127	Ignition Starter Co.	111	Panworld Mfg. Co.	117	Warren Motor Car Co.	119
Continental Motor Mfg. Co.	129	Imperial Automobile Co.	123	Parish & Bingham Co.	128	Weed Chain Tire Grip Co.	113
Corcoran Lamp Co.	118	Inter-State Automobile Co.	123	Peerless Motor Car Co., Back Cover	158	Western Automobile Supply Co.	116
Cotta Gear Mfg. Co.	138	Invincible Starter Co.	115	Perfection Spring Co.	158	Western Electrical Instrument Co.	111
Covert Motor Vehicle Co.	124	Jackson Automobile Co.	122	Petrel Motor Car Co.	56	Weston-Mott Co.	121
Crane, Wm. M., Co.	109	Jacobson Machine Mfg. Co.	116	Piel, G., Co.	59	Wheeler & Schebler.	54
Cullman Wheel Co.	138	Jeffery-DeWitt Co.	78	Pilot Motor Car Co.	118	White Co., The.	104
		Jiffy Auto Curtain Co.	93	Pittsfield Spark Coil Co.	100	Willard Storage Battery Co.	95
Dal Mfg. Co.	112	Johns-Manville, H. W., Co.	107	Prest-O-Lite Co.	108	Willys-Overland Co.	75
Davis, G. W., Carriage Co.	123	Jones Speedometer	105	Prosser, Thos., & Son.	138	Wilson Motor Starter Co.	100
Dayton Motor Car Co., Front Cover	138	Kamlee Co.	108	Pullman Motor Car Co.	127	Winton Motor Car Co.	113
Dayton Rubber Mfg. Co.	138	Kellogg Mfg. Co.	106			Wisconsin Motor Mfg. Co.	113
Dean Electric Co.	129	Kent, Atwater Mfg. Works.	67	Queen Mfg. Co.	104	Wolverine Lubricants Co.	128
DeTamble Motors Co.	137	Kimball Tire Case Co.	127			Woven Steel Hose & Rubber Co.	106
Detroit Electric Appliance Co.	126	King Motor Car Co.	126	Rajah Auto Supply Co.	128		
Diamond Rubber Co.	116	Kinsey Mfg. Co.	113	Rayfield Carburetor	126	Yankee Co.	120
Dixon Crucible Co., Joseph.	120	Kissel Motor Car Co.	58	R. C. H. Corporation.	117		
Dorris Motor Car Co.	125	Kline Motor Car Corp.	105	Remy Electric Co.	82	Z. & A. Mfg. Co.	138
Double-Fabric Tire Co.	114	Knight Tire & Rubber Co.	120	Republic Motor Car Co.	117	Zenith Carburetor Co.	116
Doves, Stamping & Mfg. Co.	140	Knox Automobile Co.	128	Republic Rubber Co.	115	Zilio Sales Co.	64-65
Duff Mfg. Co.	109	K. W. Ignition Co.	102				

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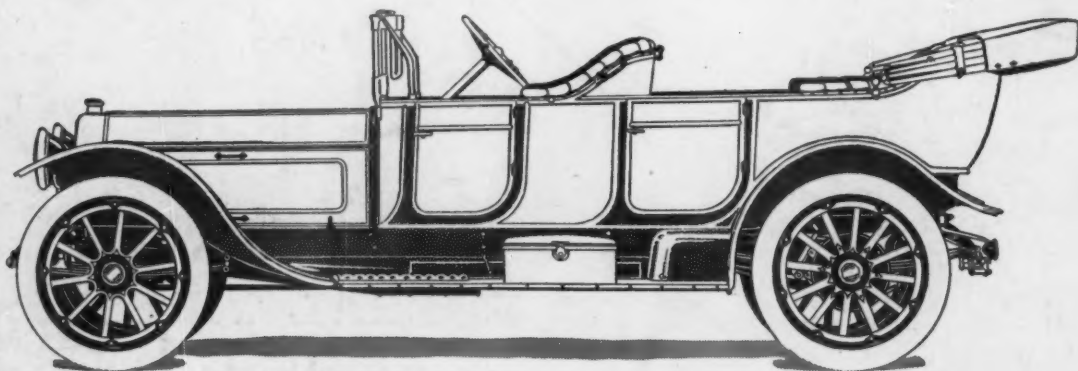
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